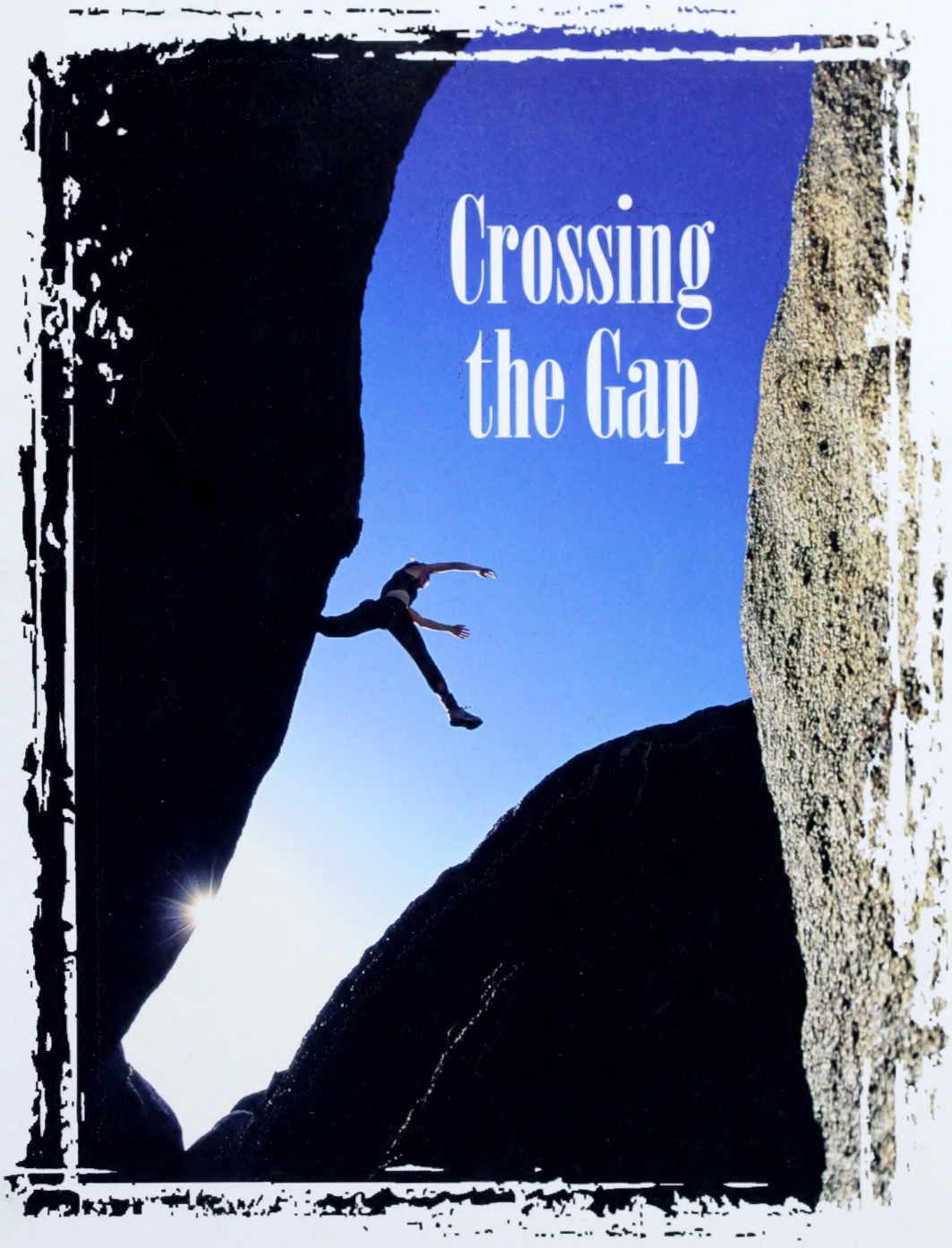
AL-1 904
c.2



OUR MISSION

We support a community of researchers who generate knowledge that improves the health and quality of life for Albertans and people throughout the world.

Our long-term commitment is to fund basic patient and health research based on international standards of excellence and carried out by new and established investigators and researchers in training.

TABLE OF CONTENTS

Chairman's and President's Message	4
Crossing the Gap . . . Between the Known and Unknown	6
Scientific and Financial Information	54
List of AHFMR Personnel	65
Financial Statements for 1996	69

0366672798-T5J3S4-BR01

ALBERTA HERITAGE FOUNDATION
FOR MEDICAL RESEARCH
3125-10180 101 ST NW
EDMONTON AB T5J 9Z9

Alberta Heritage Foundation for Medical Research
3125 ManuLife Place
10180 - 101 Street
Edmonton, Alberta T5J 3S4

Phone: (403)423-5727 Fax: (403)429-3509
email: postmaster@ahfmr.ab.ca
Website: http://www.sas.ab.ca/ahfmr

This document contains the Triennial Report for 1992/93, 1993/94, and 1994/95, and financial and scientific information making up the 1996 Annual Report. Research described also includes 1996 activities.

October 1996

Photos on pages 11, 18, 31, and 51 reprinted by special permission from the book This is Our Work: The Legacy of Sir William Osler by Ted Grant, 5 Span Books, Pakenham, Ontario

Société canadienne des postes
stage paid Port payé
ailed in Canada si posté au Canada
siness Reply Réponse d'affaires
3666727**98** **01**

Crossing the Gap . . .

Alberta Heritage Foundation
for Medical Research

Triennial Report
for 1992/93 to 1994/95
and
Annual Report
for 1995/96

Between the Known and the Unknown

AHFMR's support and leadership has enabled Alberta to become one of the 10 top medical research centres in North America.

Working with Alberta universities and other partners, we have fostered a world-class community of scientists who are learning why the body breaks down, how it can be repaired, and how to prevent disease.

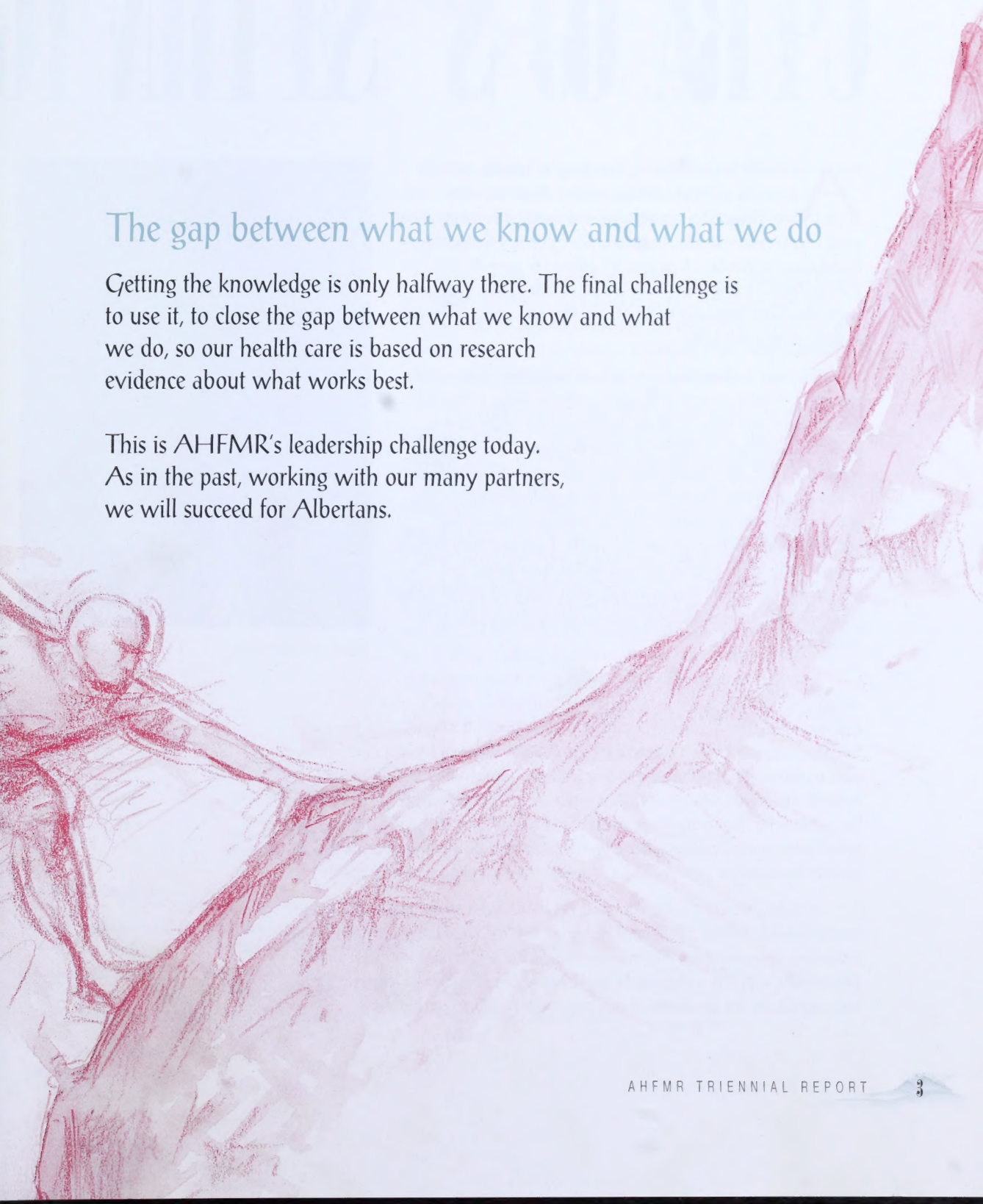
Now the challenge is to achieve the same excellence in health research, where the laboratories are the communities we live in and the places we go for health care.

AHFMR has leapt into that challenge.

The gap between what we know and what we do

Getting the knowledge is only halfway there. The final challenge is to use it, to close the gap between what we know and what we do, so our health care is based on research evidence about what works best.

This is AHFMR's leadership challenge today. As in the past, working with our many partners, we will succeed for Albertans.



CROSSING

AHFMR has accepted the challenge of helping Alberta sustain a quality healthcare system, based on new knowledge about our bodies and research evidence about what care works best. The Trustees of the Alberta Heritage Foundation for Medical Research are pleased to present this Triennial Report, describing how we are meeting that challenge with innovative programs in health research and continued success in basic science programs.

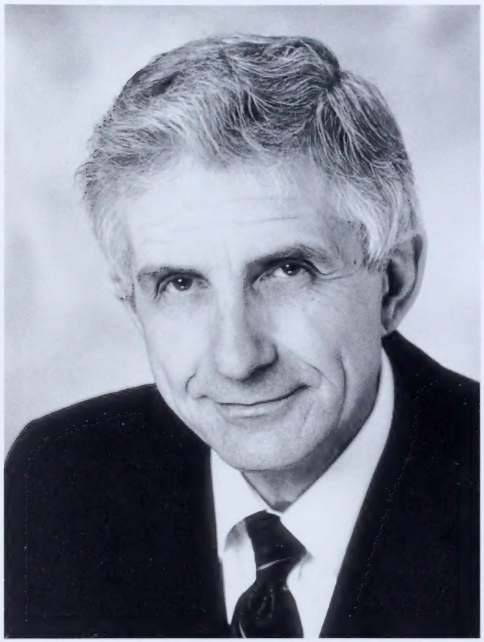
Alvin G. Libin

Our core business has always been supporting biomedical research to identify causes of diseases and new ways to prevent or control them. We have relied on a national and international network of advisors to ensure we fund excellence, and as this report demonstrates, the scientists have rewarded Albertans with outstanding success. Their contributions to understanding health and to improving patient care have earned them honors and additional funding from around the world. Each year they bring to Alberta millions of outside research dollars from public and private sources – more than two dollars for every AHFMR dollar invested – and their expertise is in demand by collaborators the world over.

To further close the gap between what we know and what we do, AHFMR is building on success in biomedical research and expanding health research activities. Our innovative S.E.A.R.C.H. program has been enthusiastically embraced by the Alberta Regional Health Authorities, who recognize it meets the need to provide their people with the skills to use research findings and to conduct studies related to regional programs. To increase the capacity for quality health research, AHFMR also created a Population Health Investigator Award category. New investigators include a lawyer examining the commercialization of genetics and a sociologist investigating women's health.

In 1995, Alberta Health entrusted AHFMR with added responsibilities in health research. Under a collaborative agreement, the Foundation conducts health technology assessment for Alberta, administers the health research funds for the Department, supports a program to facilitate the dissemination of research findings, and coordinates the development of a provincial health research agenda.

THE GAP



Dr. Matthew W. Spence

This collaboration gives the Foundation another opportunity to serve the province, and we are confident it will increase Alberta's reputation as a national leader in research related to health care.

The Foundation is fortunate to be led by a dedicated Board of Trustees who keep the Foundation fiscally responsible, yet flexible to meet Alberta's needs in changing times. These Trustees acknowledge Dr. Matt Spence's enthusiastic and able leadership, and the contributions of his hard working staff.

The story of the Foundation's success is the story of the dedicated scientists who produce the knowledge, and the many partners who work with us in supporting researchers. (See page 61.) We are particularly grateful to our major partners: the Universities of Alberta, Calgary, and Lethbridge, and their affiliated hospitals, the Government of Alberta, the Alberta Cancer Board, the Alberta Regional Health Authorities, the Heart and Stroke Foundation of Canada, the Medical Research Council of Canada, and the National Cancer Institute of Canada. We also acknowledge the contributions of those who advise us in our decision-making and serve on our many committees.

We invite all Albertans to add their thanks and applause for the people who are crossing the gaps to help keep us healthy.

Dr. Matthew W. Spence, M.D., Ph.D.
President and CEO

Alvin G. Libin
Chairman

AHFMR Trustees

Alvin G. Libin (Chairman)
Calgary

Thomas K Biggs, B.Sc.
Coronation

Paul T. Davenport, B.A., M.A., Ph.D.
President
The University of Alberta
(until January 1995)

Roderick Fraser, Ph.D.
President, The University of Alberta

K. Murray Fraser, B.A., L.L., L.L.M.
President, The University of Calgary

Paul V. Greenwood, M.B., Ch.B.
M.R.C.P., F.R.C.P.(C), Edmonton

Margaret Mrazek, R.N., B.Sc.N.,
M.H.S.A., L.L.B., Edmonton

Beverley Ann MacLeod
Calgary

Nellie A. Radomsky, Ph.D., M.D.
Red Deer

Donald R. Seaman, B.Sc.
Calgary

Arthur F. Wilson, M.D., M.Sc.,
F.R.C.P.(C)
Edmonton
(until June 1993)

Between the Known and the Unknown in Heart Disease

Corinne Swinarton

"Never look back to cover a track
Just enjoy today
You can't make or borrow or pay for tomorrow
or any other day."

This is the motto of the "Lucky Tickers," Calgarians who live with a potentially fatal heart problem called "ventricular tachycardia" (VT). They are inspired by vivacious Corinne Swinarton, who helps them conquer the fear and live joyously for today.

For six years, Mrs. Swinarton has had VT "heart attacks" – as many as seven a month when she feels stressed with life's events. She's alive because she carries inside her a battery-operated rescue device that monitors and regulates her heart rhythms. If she has an attack, her pacemaker/defibrillator machine delivers a life-giving shock to readjust her heart's electrical activity. The device also records the time and strength of all attacks, for the doctor's review during check-ups.

Mrs. Swinarton lives with the device because of the research and clinical expertise of Dr. Anne Gillis and colleagues at the University of Calgary.

"I feel so fortunate to have Dr. Gillis. She is an exceptional doctor and an exceptional person," says Mrs. Swinarton.

Mrs. Swinarton also helps the healing process for other VT patients, through her work in the "Lucky Tickers" support group. She remembers her own trip through the fiery furnace of fear when she first suffered attacks.

"I tell people, 'I've been there. I know how you feel.' Mostly I listen to them and remind them how fortunate we are to be alive when only about 20% of people live through VT. We have doctors who really know what they're doing and we have these machines and drugs to control the rhythms. We're more fortunate than people who are walking around with this problem and don't know it."

Achievements in Cardiac Research

- Edmonton and Calgary are centres for major multi-centre national and international trials of new therapies for heart disease.
- Edmonton and Calgary patients have access to the newest treatments for heart disease.
- The U of C is a testing and development centre for state-of-the-art pacemaker devices.
- U of A and U of C cardiologists attracted $48 million in outside operating funds for projects.
- New understanding of congestive heart failure.
- New techniques to measure and control life-threatening chaotic heart rhythms.
- Insight into what initiates heart attacks at the cellular and molecular levels.
- New information about why defibrillation (shocking the heart to re-adjust dangerous heart rhythms) works for some patients and not others.
- Initiated new studies of how hormonal changes in menopause affect blood flow and risk of heart disease.
- AHFMR Scientist awarded Heart and Stroke Foundation Chair.
- Experimental post-stroke therapies to minimize brain damage.
- Identified patterns in how physicians treat high blood pressure, high cholesterol, and heart failure.
- U of A team received $450,000 over three years from Ciba-Geigy Canada Ltd. to tackle the problem of reperfusion injury when blood flow is returned to damaged areas after a heart attack.

"We are on the leading edge of evaluating new technologies, and we have an enormous impact on the development of future therapies.

Being at the leading edge means we offer better treatments to patients than would be otherwise available. If we don't know the right therapy for patients, we invite them to participate in a clinical trial to discover what can work for them . . . ."

Dr. Anne Gillis, Cardiologist,
University of Calgary

Dr. Anne Gillis

"There are 30 of us and the Foundation has funded all of us at crucial times in our career."

Dr. Hank Duff, Head, Cardiology
Research Group, U of C

"After three years, our survey showed more patients were prescribed cardiac drugs which have been proved effective in clinical trials, and fewer were prescribed drugs that have not been proven effective."

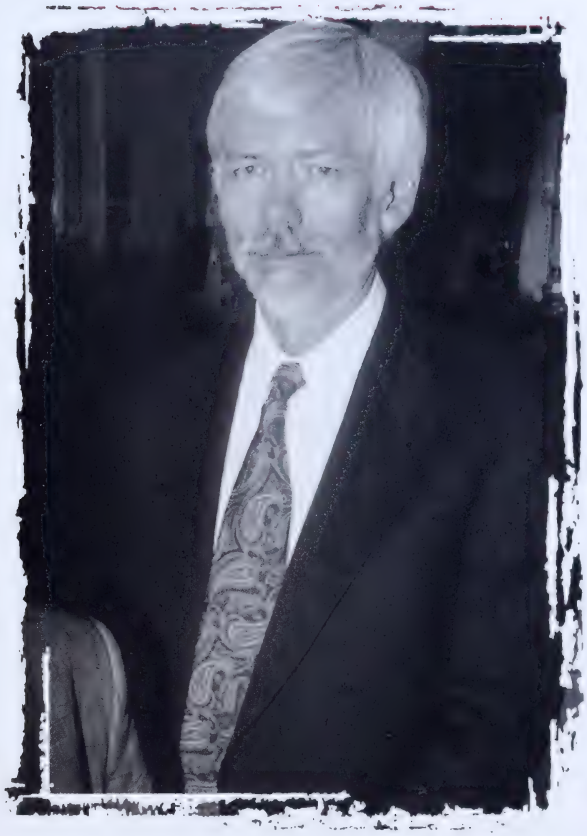
Dr. Koon Teo, Head, Epicore (cardiac) Research Group, U of A

"AHFMR has developed a climate conducive to recruiting many bright young scientists, and in cooperation with the Heart and Stroke Foundation of Alberta, assured them of the support necessary to become leaders in their fields. Albertans are fortunate."

Mr. John Paquet, Executive Director,
Heart and Stroke Foundation of Alberta

PROFILE:

SERENDIPITY PLUS



Dr. Dennis Vance

"In biology you never know – we're being surprised all the time."

Dr. Dennis Vance

In October 1995, Dr. Dennis Vance crossed the stage at Munich University in Germany to accept the Heinrich Wieland Medal. It places him in the grand company of Nobel Laureates and other top biochemists in the world who are previous Wieland winners.

Many would say brilliance, dedication and hard work got him there, and they would be right, but Dr. Vance credits serendipity and curiosity. He won the award for discovering something he never set out to find – an enzyme that suppresses liver tumor cell growth.

A long-standing curiosity has driven Dr. Vance's distinguished career as a biochemist. For several decades, he has applied his curiosity to understanding lipids, and their role in disease. Lipids are insoluble fats required for normal body function. Cholesterol is the most famous and infamous lipid, because too much leads to coronary artery disease.

Dr. Vance is best known for his work on a lipid called PC, found in cell walls. He showed that blocking production of PC reduces the amount of so-called "bad cholesterol" the liver makes, which might lower the risk of heart disease. He also discovered that the liver enzyme PEMT can convert a starter molecule into PC lipid. He then set out to do the basic biochemistry that would reveal more about PEMT.

"In the process of doing what we normally do, we found out something surprising," he says. First, he discovered he was working with a new, unknown form of PEMT, which he named PEMT-2. This experiment likely wouldn't have happened if his wife, Jean, hadn't been in the lab across the hall. She is also a member of the U of A Lipid and Lipoprotein Research Group, which Dennis Vance heads. Because she discovered how to separate liver components, she had the liver particles her husband needed stashed in her lab freezer.

Achievements in Lipid Studies

- Development of a drug to prevent heart damage due to loss of blood flow during cardiac surgery.
- Discovery of factors controlling how the liver gets rid of excess " bad cholesterol."
- New information linking lipoprotein ApoE to the risk for Alzheimer's disease.
- More understanding of how so-called "good cholesterol" removes excess cholesterol from cells.
- Providing highly specialized care for referred patients with severe coronary artery disease.
- Five team members have Medical Research Council of Canada awards.
- Four AHFMR U of A lipid researchers won national or international honors.
- The team brings in $2 million annually in outside operating funds.

When Dr. Vance and a colleague put the PEMT-2 gene into a line of rat liver cancer cells, which do not have PEMT (as normal, healthy cells do), they observed a startling response: PEMT-2 dramatically slowed the growth of the liver cancer cells.

Could it be a tumor suppresser? Could it be the first look at a enzyme that would eventually become a new drug for lethal liver cancer?

The discovery took Dr. Vance to the Wieland podium, and since then he has shown that PEMT-2 also regulates normal growth of the liver, further evidence that it may be a tumor suppresser.

These days Dennis Vance is excited about 17 mice. These special "knock-out" mice will bear offspring with defective or missing PEMT-2 genes, so the curious biochemist can watch what happens when there is no PEMT-2 in the liver, and probably determine if too little of the enzyme causes liver cancer. Anytime Dr. Vance wants more excitement, he can wander into the labs of the other eight scientists in the Research Group, seven of them funded by AHFMR, and earning their own accolades.

Though science is a passion, there are other things that excite this soft-spoken man, known for his warm and wise leadership among students and colleagues. He enjoys hiking, fishing, and golfing. (Jean suggests his hole-in-one was also courtesy of the goddess Serendipity.)

There are some things Dennis Vance wishes the rest of us understood about the medical research business.

"We don't have summers off. We do more than teach. We work weekends and nights. But it's a very rewarding job. Any scientist who is successful will tell you they love it.

"The time it takes to accomplish something in this business is the major frustration. I have very good people in my lab, 10 of them. If I had done all the experiments myself, I would have accomplished next-to-nothing."

He sees his Heinrich Wieland Medal as a testament to the value of supporting curiosity-based research, which is so fundamental, it has unpredictable benefits for medicine. "It's ironic that some of our current work has more impact on cancer than heart disease, which has traditionally been our focus."

The unlimited possibilities for a curious mind keep him passionate about his science.

STAYING HEALTHY

For information on heart health, contact:
The Alberta Heart Health Program
phone (403) 427-2653

Alberta Heart and Stroke Foundation:
Calgary phone (403) 264-5549,
Edmonton phone (403) 451-4545

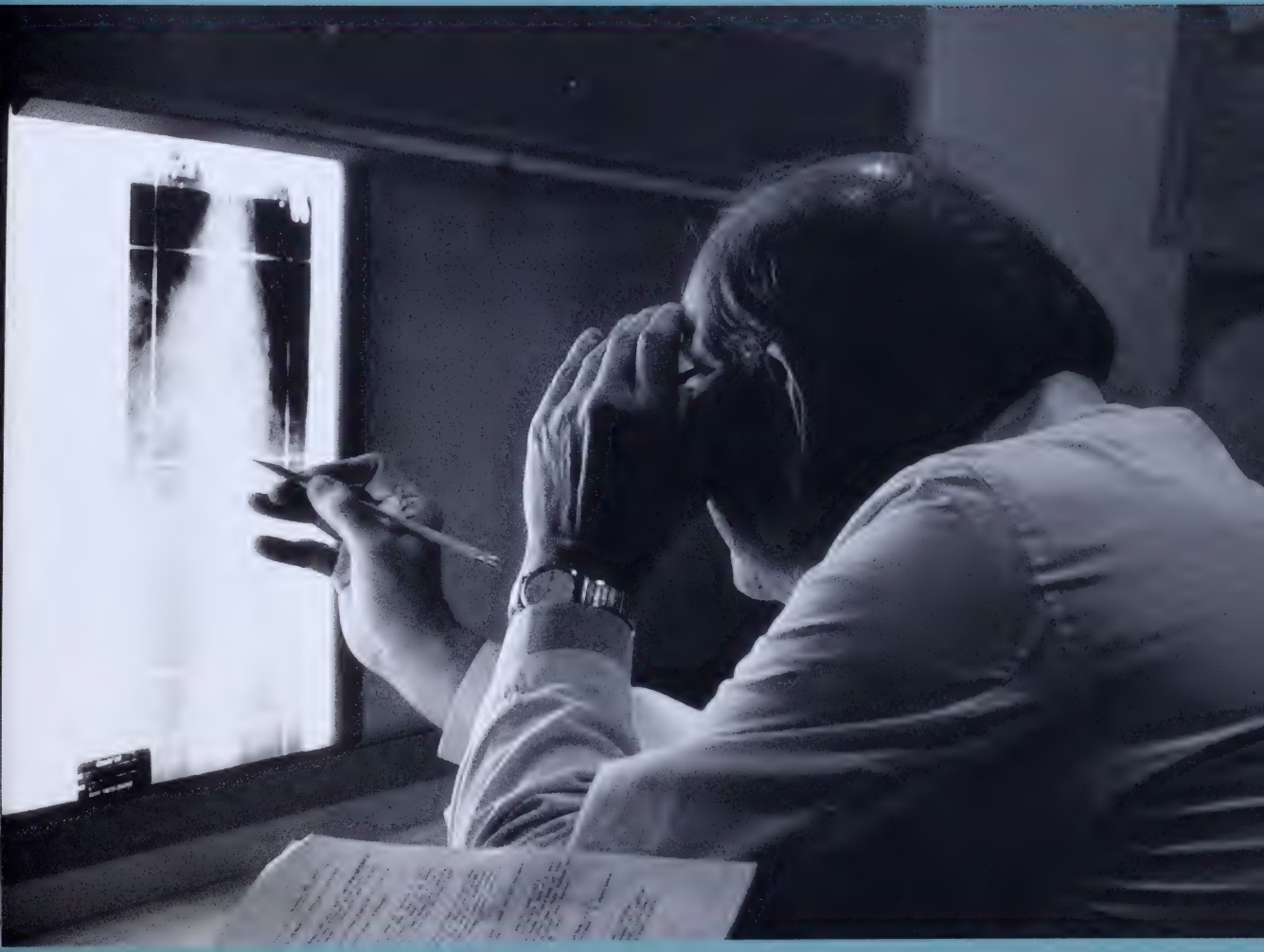
Alberta Centre for Well Being:
phone (403) 453-8692

Health in Action Website:
http://www.health-in-action.org

Funding Partners: Heart and Stroke Foundation of Alberta, Heart and Stroke Foundation of Canada, Medical Research Council of Canada, Park Davis Canada, Canadian Diabetes Association, Muttart Research and Training Centre, Servier Laboratories, Ciba-Geigy Canada Ltd., University of Alberta

CROSSING THE GAP . . .

Between the Known and Unknown in Cancer



Dr. Chris Bleackley and Alison Darmon

HOW KILLER IMMUNE CELLS WORK

In healthy people, killer T-cells in the immune system sidle up to tumor cells and inject lethal proteins into them so they destruct before cancer develops. Dr. Chris Bleackley identified two proteins which killer cells deliver to their target. Then in 1995, he and PhD student Alison Darmon discovered that one of these lethal proteins destroys because it turns on another natural cell process called programmed death.

This information could someday be applied to prevent rejection in organ transplants or to boost immune systems of cancer patients.

UNDERSTANDING HOW CANCER BEHAVES

Once cancer cells are present, the challenge is to keep them from spreading. Dr. Dylan Edwards has identified some of the molecular weaponry that cancer cells use to invade healthy tissue. He has also found some of the proteins healthy cells produce to protect themselves from cancer. This information is useful in developing new treatment approaches.

LEARNING HOW CANCER BEGINS

In cancer, the normal genetic controls on cell division are faulty, so that malignant cells divide and multiply wildly. Dr. Susan Rosenberg challenged the popular theory that only dividing cells mutate when she discovered that non-dividing cells can also mutate. She has identified one way the mutations occur. This information can help explain how various kinds of cancer originate.

In 1996, Dr. Rosenberg won two national research awards for her groundbreaking studies.

Representatives of P.A.P.

Nineteen Red Deer women are raising awareness about a deadly disease that is curable in its earliest stages – cervical cancer. They call themselves "Prevent, Act, and Plan" or P.A.P., after the test used to detect this cancer. The group was started by a research team headed by Dr. Gavin Stuart, Director of the Tom Baker Cancer Clinic in Calgary. Dr. Stuart is implementing a cervical cancer screening program in the province with funding from the Health Services Research and Innovation Fund, provided by Alberta Health and administered by AHFMR.

STAYING HEALTHY

For information on Cancer Prevention contact:
Canadian Cancer Society
1-800-661-2262
Calgary: (403) 244-2791
Alberta Cancer Board (403) 482-9300
Alberta Program for the Early Detection of Breast Cancer 1-800-667-0604
Alberta Breast Cancer Foundation: (403) 452-1166
Calgary Regional Health Authority Health Connection (403) 571-8070

Achievements in Cancer Research

- Insights into controlling blood cell development in leukemia.
- New clues about the way immune cells recognize cancer cells.
- The discovery of two enzymes that could help researchers and physicians detect which tumors are likely to spread before it actually happens.
- New insights into cell growth and division, which are out of control in cancer.
- The discovery of naturally-occurring proteins which can block cancer invasion.
- Identification of specific chromosomal changes underlying the development of a childhood kidney cancer called Wilms Tumor.
- Development of a new marker for identifying the progression of skin cancer.
- Evidence that aberrant activity of the human C-SRC gene is key in the development and progression of breast cancer.
- New information about why white blood cells kill tumor or diseased cells.
- Understanding a natural repair mechanism in DNA damaged by carcinogens.
- Discovery of a molecule that leads the natural killer cells to their targets, tumor cells.
- Discovery of a peculiar DNA pattern that signals the existence of a new tumor suppresser gene.
- Identification of stages as a healthy cell alters to a mutated and possibly malignant one.
- Discovery of how genetic mutations occur in cells that don't normally grow or divide in the body.

IMPROVED RESEARCH TECHNIQUES

To identify the genes involved in cancer, researchers must determine the genes' location on a strand of DNA so small, it's hardly visible with a high powered microscope. Dr. Linda Reha-Krantz has discovered better methods of sequencing DNA to learn more about how normal cells are different from cancer cells.

LIGHT ON CANCER

A Tibetan fungus could become a new weapon in the war against cancer. Researchers are discovering light therapy can slay cancer cells. Tumor cells are treated with a light sensitive drug; then when laser light is directed at the cells, the toxic drug is activated and destroys them. The search is on to identify photosensitive drugs without major side effects. Dr. Ron Moore and Dr. Bill Lown have found a compound from a fungus used in Chinese herbal medicine that looks very promising.

"AHFMR's support of world class researchers has contributed significantly to our understanding of cancer. Because of our partnership with AHFMR, the Alberta Cancer Board is now on the threshold of major advances in the diagnosis and treatment of cancer."

Dr. Jean-Michel Turc
President, Alberta Cancer Board

Funding Partners: Medical Research Council of Canada, Alberta Cancer Board, Canadian Cancer Society, National Institutes of Health (USA), Carol Yates Memorial Endowment Fund for Cancer Research, Leukemia Research Fund of Canada, Human Frontiers Science Program, Canadian Breast Cancer Foundation, Cancer Research Institute, Central Research Fund, Edmonton Civic Employees Charitable Assistance Fund, National Cancer Institute of Canada, Terry Fox Foundation, Natural Sciences and Engineering Research Council, U of A Central Research Fund, U of A, U of C

PROFILE:

THE AGING CONNECTION

Dr. Karl Riobowol

Doctor Karl Riabowol is obsessed with aging, not neurotically like some North Americans, but magnificently, in service of a cause – learning how natural aging of cells is related to cancer.

Most human cells constantly divide, especially early in life, but as cells age they divide less rapidly, and finally not at all. In contrast, most cancer cells are immortal. They have been transformed from normal cells into cells which divide endlessly, until they take over the body and often destroy it. If scientists can identify the brakes that halt cell division in healthy cells during aging they might use the brakes to stop cancer cells from growing.

Dr. Riabowol and his post-doctoral fellow, Igor Garkavtsev, have identified a gene that looks like a powerful tumor suppresser that might act as such a brake.

Genes control all cell activity by giving the cells instructions to create proteins. Scientists have identified at least 150 oncogenes which can transform healthy cells into cancerous ones. Fortunately, the body also has life-saving tumor suppresser genes, which shut down tumor cells, but only a handful have been identified. For example, the p53 tumor suppresser gene is defective in about 60% of all human cancers. Researchers are now testing a new treatment for colon cancer based on increasing the activity of p53.

Dr. Riabowol's newly identified gene, p33, may prove as significant as p53. P33 stops cancer cell growth in mice, and if p33 gene activity is blocked in mice cells, tumors appear. Next, Dr. Riabowol's group will analyze DNA from human tumors to see if many tumors have p33 mutations. If they do, it's a hot item.

In related work, Dr. Riabowol is looking for patterns of mutated genes, including p33, in early-stage breast cancer. Such patterns could be useful in diagnosing disease early, and predicting its course.

AIDS DISCOVERY

Dr. Riabowol is one of many researchers around the world excited about telomeres. These are the ends of chromosomes which drop away as normal cells divide. Most of the time, the telomeres are replaced, but as cells age, they begin to permanently lose telomere bits. Dr. Riabowol's lab and two others have evidence that HIV infection causes premature aging of immune cells. Recently, researchers found that, contrary to prior thought, the immune system does mount a vigorous response to HIV, and there is a huge turnover of cells. Apparently, AIDS patients are burning their immune systems out.

Dr. Riabowol, Dr. John Gill and AHFMR student, Leslie Bestilny, discovered that people with AIDS lose their telomeres about five times more rapidly than healthy people. The finding has implications for AIDS therapy.

"It suggests you should treat the virus as soon as it appears, with whatever you have, and that later-stage treatment should include reconstructing the immune system by replacing stem cell components or other means," explains Dr. Riabowol.

Their discovery left the researchers rudely smacked against the harsh realities of the competitive world of medical research, when almost the same findings were published first by a large, very well-funded American team in private industry. "We were crestfallen," admits Dr. Riabowol, "but elated that we could keep pace with the largest players in this field."

But he handles this and other pressures with grace and humor, partly because he was well-seasoned by post-doctoral work at the prestigious Cold Spring Harbor Lab in the U.S. He explains, "It is a very, very competitive place with a lot of bright, ambitious people. When you do a post-doc there, you either leave within the first year or develop an attitude that will see you through it....

"You have to be able to look at work and smile. If you're involved in an intense race and you miss, you shrug it off and carry on. It's important to take triumphs and defeats personally and intensely, but not let them rule your life. If you let every bump in the road affect your driving, you have problems.

"I didn't go into science to get a degree and get a job and make a living. I got into it because I am very interested in 'Why do things age?' That's one of the big questions in biology."

Does being a tad past the big "40" influence Karl Riabowol's views on aging? "Well, my mental age is about 18, so I'm not terribly worried!" he says, laughing. "I haven't noticed huge physical limitations yet, though I do hurt more after a good day of skiing than I used to."

"It's important to take triumphs and defeats personally and intensely, but not let them rule your life."

Dr. Karl Riabowol

Funding Partners: National Cancer Institute, Medical Research Council of Canada, Alberta Cancer Board, Canadian Breast Cancer Foundation, Canadian Genome Analysis and Technology, S.J. Solberg Endowment, U of C

CROSSING THE GAP BETWEEN THE KNOWN AND UNKNOWN . . .

in Neuroscience

Controlling Seizures

Dr. William Colmers' discovery could be the beginning of a way to prevent epileptic seizures. He knew that stimulating healthy brain tissue until it produced small seizures caused an increased production of a chemical called Neuropeptide Y (NPY). He had a hunch that NPY could play a major part in seizure control, and sure enough, when epileptic rat brain slices were treated with NPY, seizures ceased immediately.

Dr. Colmers then secured permission to study bits of brain tissue removed from patients suffering from focal epilepsy, for whom surgery was the last resort. He treated the human brain tissue with NPY and found, once again, that seizure activity stopped.

Further research is necessary before testing NPY on people with epilepsy.

Repairing Brain Cells

For 50 years, biologists were convinced that adult brain cells could not divide, grow and specialize into neurons. So when Heritage researcher Dr. Sam Weiss and Dr. Brent Reynolds first announced that brain cells from adult mice could produce new nerve cells in culture, people had a hard time believing it. The trick is a growth factor applied to the cells.

This research may lead to new drugs for neuron replacement or repair, and the cell culture system is in high demand by pharmaceutical companies who want to use it to test experimental drugs for Alzheimer's disease, Parkinson's disease and other conditions.

Dr. Weiss and Dr. Reynolds formed a company called NeuroSpheres to commercialize their technology. Initially, the company received start-up funds from the AHFMR Technology Commercialization Program, the Medical Research Council of Canada, and pharmaceutical companies.

Two years later, NeuroSpheres is thriving and has many joint ventures with industry.

Funding Partners: Eli Lilly Canada, Medical Research Council, University of Alberta Hospitals Foundation, Natural Sciences and Engineering Research Council, Alberta Lung Association, Toronto Hospital for Sick Children, Ciba-Geigy Canada, Muscular Dystrophy Association of Canada, Networks of Centres of Excellence, Edwin L. and John Gustus Endowment in Vision Disorders, Johannsen Research Fund, Rick Hansen Foundation, Savoy Foundation, U of A, U of C

Neuroscience Achievements

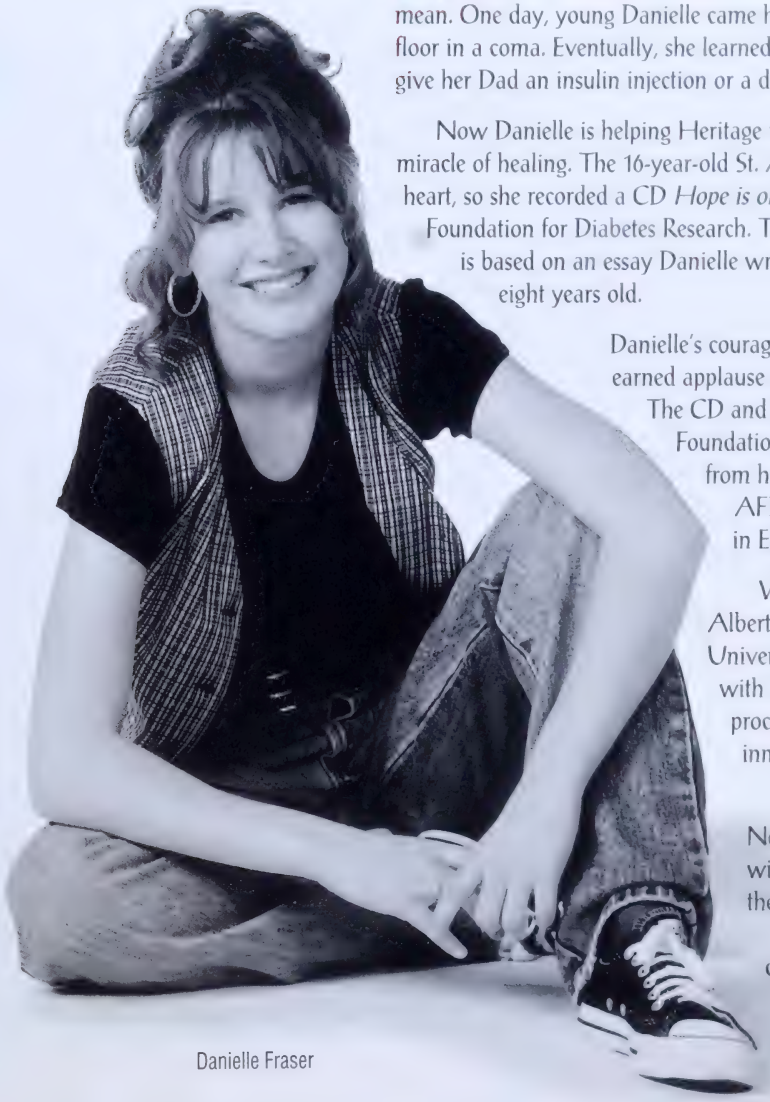
- Advances in functional electrical stimulation, which uses small electrical currents to move paralyzed muscles.
- Information on the role neurotransmitters play in controlling vision.
- Insights into the brain's ability to change in response to stress, learning, degenerative diseases, and senility.
- Evidence that injured nerves and spinal cord cells can be regenerated.
- Identifying the brain responses in tinnitus, a common hearing condition characterized by ringing in the ears.
- Information on how our eyes adapt to different light conditions.
- Locating some of the body signals that go wrong in Sudden Infant Death Syndrome (SIDS).
- Discovering how the nerves and muscles responsible for breathing mature during fetal development.
- Information on how the brain helps control blood pressure.
- A new bionic glove that restores some hand movement in select quadriplegics.
- A new means of measuring spastic rigidity in people with Parkinson's disease.
- Information on how nerves control digestion and inflammation in the gut.
- Evidence of a link between muscle fatigue and pain.
- Insights into the causes of nerve damage in people with diabetes.
- Information on why anti-anxiety drugs such as Valium and Librium stop working for some people.
- Development of a new software program that allows researchers to image changes in nerve cells.

Between Research and Patient Care

Hope is on the way

Ever since Danielle Fraser was a little girl, she asked: "Will there be a miracle?" The miracle she wanted was to make Daddy better, because Earl Fraser has insulin-dependent diabetes, and she learned early what that can mean. One day, young Danielle came home to find her father collapsed on the floor in a coma. Eventually, she learned when to call an ambulance and when to give her Dad an insulin injection or a drink of juice.

Now Danielle is helping Heritage researchers and others discover a scientific miracle of healing. The 16-year-old St. Albert teenager has a voice as big as her heart, so she recorded a CD *Hope is on the Way* to raise funds for the Alberta Foundation for Diabetes Research. The lead song *Will There Be A Miracle?*, is based on an essay Danielle wrote about her father when she was eight years old.



Danielle Fraser

Danielle's courage and her amazing musicianship has earned applause and donations from Albertans. The CD and tape have raised $35,000 for the Alberta Foundation for Diabetes Research, and proceeds from her new music video will be shared by the AFDR and the Juvenile Diabetes Foundation in Edmonton.

When the CD was released at a gala in St. Albert last fall, the Islet Cell Team at the University of Alberta briefly shared the stage with Danielle, to express gratitude for the CD proceeds which have helped support their innovative research program.

Dr. Ray Rajotte, Dr. Garth Warnock, Dr. Norm Kneteman and a handful of Albertans with diabetes have made world history in the struggle to defeat the disease.

Alberta diabetics who have received donor insulin-producing cells through transplantation have been free of insulin therapy longer than any other patients in the world. The researchers attribute the success of their program to the strength

(Hope continued . . .)

of their basic research, which has identified superior methods of harvesting and preserving the islets, and preventing rejection.

In addition to advancing patient care, the team has filed four patents to commercialize innovations emerging from their labs.

Meanwhile, Danielle is an impressive singing ambassador for scientists and people with diabetes, spreading understanding, hope and joy. She wants everyone to know insulin isn't a cure, only a way to manage the disease.

The cure is still to come, but it's on the way.

To purchase the CD or the *Will There Be A Miracle?* music video, contact either the Alberta Foundation for Diabetes Research at 1-800-563-2450 or the Juvenile Diabetes Foundation Edmonton Campaign at 403-428-0343.

"There are now well over 100 different drugs in clinical trials that are designed to alter the course of MS, and we are testing some of them. We are also developing new therapies to help our patients cope with the symptoms of the disease, and hopefully live with MS a little bit easier."

Dr. Robert Bell, Physician at the Calgary General Hospital, and U of C Heritage medical researcher

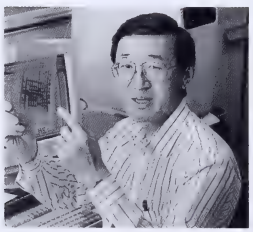
HOME CARE STUDY

With the restructuring of the health care system, emphasis has shifted from institutional care to home care. Dorothy Forbes, a graduate student in the Faculty of Nursing at the University of Alberta, is measuring the quality of life and satisfaction of home care clients. This study will provide some understanding of what is important to home care clients, essential information for decisions about policies and programs.

POTENTIAL VACCINE FOR DIABETES

A vaccine component currently used to prevent tuberculosis is being tested at the University of Alberta as a possible preventative measure for juvenile diabetes. Results of the vaccine trial, headed by Heritage researcher Dr. John Elliott and pediatrician Dr. Bob Couch, will be available in about two years. If the vaccine proves useful, it will be tested on young people who are at very high risk for diabetes, but do not yet have it.

Dr. John Elliott



Dr. Dennis Kunimoto

TRACKING TB

The recent resurgence of widespread TB is causing alarm. Tracing who infected a person with the disease is key to preventing an epidemic. Dr. Dennis Kunimoto used a DNA fingerprinting technique to develop a test that makes it easier to identify where a person contracted TB.

PROFILE:

PRESCRIPTION FOR EXERCISE

Dr. Ron Zernicke

Many Olympic athletes use the computerized science of body movement to analyze and perfect their performances. The science is called biomechanics, and some of its engineering principles are also used to design high-performance cars. Biomechanics expert Dr. Ron Zernicke is after "high-performance bones" that will help prevent injury and disease. His ground-breaking work ranges from analyses of knee pain in volleyball players to studies of walking problems after hip surgery.

He foresees the day when people will be prescribed a custom exercise and diet program, not only for a healthy heart, lungs, and muscles, but also for bones. Unfortunately, some people are doing absolutely the wrong thing. His studies confirm that the North American junk food diet, with high fat and high sugar, significantly decreases bone quality and strength.

As for exercise, Dr. Zernicke shares the concerns of others who have shown that young, competitive athletes can be trained dangerously hard and fast, especially in gymnastics, running, and ballet, where the diet may be inadequate because of concern for weight gain. His studies confirm that this scenario can lead to bones so weakened, osteoporosis or injury occur early in life. His analysis of running movements in animals is identifying one aspect of ideal training, that is, the strain and load on leg bones that will stimulate cells to produce new bone, a process which occurs naturally in childhood and adolescence but declines as we age. This kind of information could someday be the basis for specific exercise programs to promote bone health and aid rehabilitation after injury.

Hip surgery patients – about 20 thousand Canadians a year – find relief from pain, but are often left with a lurching walk that makes activities difficult and may strain the other hip. Dr. Zernicke tests patients before and after surgery to analyze how muscle activity and gait change. If he can discover the source of walking problems, the information will guide rehabilitation therapy.

"Eventually we'd like to look at different surgical approaches and see if there is a greater problem walking after surgery with some approaches than others," he explains.

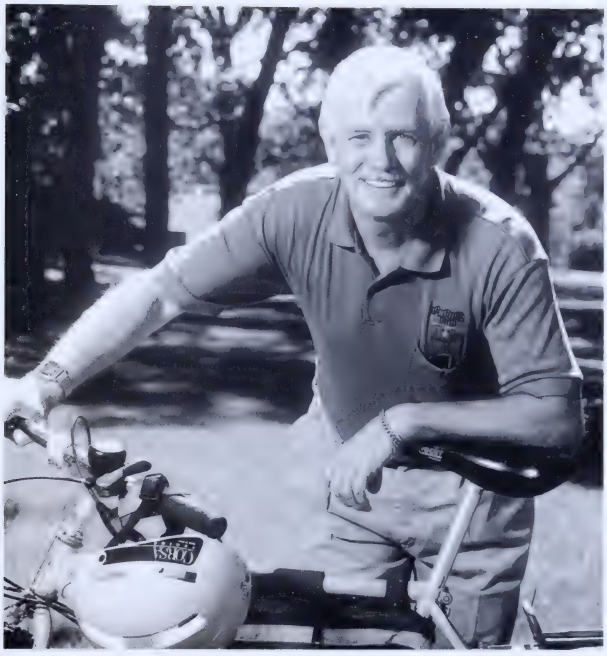
Dr. Zernicke's interest in bone and muscle mechanics may have something to do with his own health history. He has sprained his ankles about 35 times, beginning with two skating injuries in grade school. Long-term damage means no more football or running, but he still cycles, swims, hikes, skis, and attacks the stairmaster.

Meanwhile, he keeps a professional and fatherly eye on Kristin and Eric, his 13-year-old twins who play competitive water polo. Their ankles should be safe, but their shoulders are vulnerable, and they had better train just the right amount. Dr. Zernicke laughs at himself when he confesses: "I tell my daughter, 'Now, you do drink a lot of milk, but why don't you take this calcium tablet too, because maybe it will make a difference!'"

Dr. Ron Zernicke is Chair of the Arthritis and Joint Injury Group in the McCaig Centre at the University of Calgary. With 30 faculty and about 70 students, fellows and technicians, the group is a world leader in understanding basic causes of arthritis and joint injury, and in developing diagnostic techniques, innovative treatments, and prevention programs. In addition to support from AHFMR and many other public sources, Calgary corporate and private citizens have contributed more than $4.5 million under the Project Motion Campaign.

STAYING HEALTHY For more information on arthritis, please call the Arthritis Society's Helpline: 1-800-321-1433.

Major Funding Partners: The University of Calgary, The Western Orthopedic and Arthritis Research Foundation (Project Motion), the Medical Research Council of Canada, the National Sciences and Engineering Research Council, The Arthritis Society, the Canadian Orthopedic Foundation and many others.



Bob Thompson

Hip surgery hasn't stopped Bob Thompson from cycling, golfing, and walking long distances, though sometimes his hip and leg painfully let him know he better rest them for a few days. Not all hip surgery patients are so active, but hopefully more of them will be, with improved rehabilitation. Dr. Ron Zernicke's gait research is providing the basis for developing physiotherapy to help prevent lopsided walking and return patients to active living.

Bob Thompson participated in the research, which uses state-of-the-art computerized technology to analyze the forces on muscle and bone while walking.

Contributions to Patient Care

- AHFMR funds the Primary Care Research Unit, which coordinates and funds research carried out by Alberta family physicians
- A Heritage funded researcher leads the Alberta Asthma Centre in Edmonton, where researchers and physicians work together to identify the extent of asthma in Alberta, understand causes, and educate physicians and the public about it
- Advances in the development of functional electrical stimulation, a therapy which allows paralyzed people to move their muscles with the aid of small electrical currents
- Experimental drugs for diabetes, high cholesterol, stroke, arthritis, cancer, nerve repair, AIDS, hepatitis and heart disease
- Multicentre drug trials for diabetes, multiple sclerosis, high cholesterol, stroke, arthritis, cancer, Alzheimer's disease, nerve repair, stomach ulcers
- New therapies for heart attack patients
- Better surgical techniques to destroy prostate and bladder tumors
- New drugs derived from Chinese herbal medicine for the treatment of high blood pressure and cancer therapy
- A change in the treatment of burn patients has resulted in a decline in infection and savings for the health care system
- Information on the prevalence of mental illness in Edmonton
- Development of a device to test the effectiveness of artificial surfactant, a substance used to treat lung damage in premature babies
- Development of a drug to minimize heart damage during open heart surgery
- AHFMR funded workshops to educate physicians and researchers on the latest developments in areas such as immunization, nutrition, and living wills

Continued . . .

Patient Care Contributions . . .

- Co-funding of the Health Knowledge Network, which links researchers and Alberta health professionals to health and medical research databases. Studies show most physicians alter their patient-care decisions after accessing relevant literature
- Understanding of how blood flow influences healing joint injuries and subsequent development of arthritis
- Evaluation of the national implementation of the Arthritis Self-Management Program
- An experimental new ASA that controls pain, but doesn't cause stomach problems
- Development of an implanted glucose sensor for monitoring blood sugar levels
- Introduction of a fitness program to help people suffering from heart failure
- Development of orthotics to manage foot pain for people with diabetes
- Defined how a new therapy for cystic fibrosis affects airway mucus
- Advances in islet cell transplants for people with juvenile diabetes
- Establishment of a new gait laboratory at the Glenrose Hospital
- Improved surgical techniques for people with knee injuries
- Information on how ligaments differ in males and females
- A new method for detecting hearing problems in infants
- Insights into how diet and activity affect bone health
- A new test to trace who infected a person with TB
- Strategies for designing new local anesthetic drugs
- Knowledge of factors affecting ligament healing
- International diagnostic services for lupus
- Information on the cellular and molecular basis of inflammation in injury and autoimmune diseases
- Specialized care, including diagnostic services, state-of-the-art surgery, and rehabilitation programs at the McCaig Centre, for people with arthritis, joint injuries, and other sports-related injuries
- Identification of a protein that may be a useful target for an improved meningitis vaccine
- Information on why a lack of the protein dystrophin destroys cells in people with Duchenne muscular dystrophy
- Understanding of the immunological basis of allergies

Heritage researchers on the forefront of medical knowledge teach Alberta's future physicians and are one reason the U of A and The U of C medical schools maintain such high ranking in Canada

Note: Because of limited space, this is a selection among many direct and indirect contributions to patient care.

CROSSING THE GAP BETWEEN THE KNOWN AND UNKNOWN . . .

ABOUT GENES

Dr. Leigh Field

Five years ago, when Dr. Leigh Field started looking across all the chromosomes to find genes that carry susceptibility to juvenile (type 1) diabetes, other geneticists said it was too difficult and risky.

"But Leigh, what if you don't find anything after all that time and money!"

"Yeah, but what if I do find something! It will be really important!", she replied.

The risk paid off handsomely. Dr. Field has found three diabetes genes, beating many other scientists who have since joined the gene hunt. She has evidence that her latest gene, reported in 1996, may have the strongest influence on diabetes susceptibility of any diabetes gene discovered since the 1970s.

In another study, Dr. Field has collected DNA samples from 90 Alberta families with at least two dyslexic children, and analysis is revealing new information about genetic influences on the condition. She is also working to identify genes producing cleft lip and palate, a common birth defect.

Dr. Field explains, "I would like the public to understand how long it takes to make discoveries in medical research, and how much other people's work contributes to yours

Funding Partners: National Network of Centres of Excellence, The Medical Research Council of Canada, Juvenile Diabetes Foundation of Canada, National Institutes of Health (USA), Alberta Health, University of Calgary

and yours to theirs. That means we have to fund research long-term. It's not like a business where you develop a product and expect to see pay-off in three years. Science just doesn't work that way.

"In the long term, research definitely pays off, but you can't predict which direction it's going to go or how long it's going to take. It's a hard idea to get across because we're getting more and more conditioned to define efficiency in terms of an immediate measurable return or immediate practical outcome.

"We need room for the unpredictable, for the things that take longer but add to our knowledge. If we only do what's predictable, we're never going to have the kind of knowledge that just pops out of nowhere."

Dr. Lung-Ji Chang with Deborah Robinson

"Gene therapy offers a new approach to attacking these deadly and so far, uncontrolled conditions. It's an exciting area, and I feel privileged to be part of it."

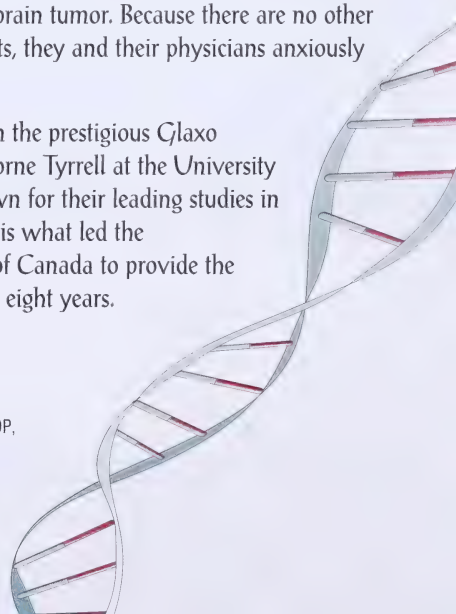
Dr. Lung-Ji Chang

Gene Therapy for AIDS

Dr. Lung-Ji Chang is persuading HIV to yield its deadly secrets, hidden deep in DNA. He and doctoral student Deborah Robinson have discovered an anti-HIV gene that could lead to front-line therapy. When the gene is inserted into HIV-infected immune cells in tissue culture, the virus can no longer replicate itself. This means the virus can't spread to infect more cells. Dr. Chang is planning clinical trials to see if gene therapy will halt HIV in patients.

Dr. Chang's team also studies two "anti-cancer" genes, which look promising for new ways to treat brain and skin cancer. He plans to mount a trial of combined gene therapy for people with a particularly lethal brain tumor. Because there are no other effective treatments available for these patients, they and their physicians anxiously await the results of Dr. Chang's work.

He is one of the principal investigators in the prestigious Glaxo Heritage Research Institute, headed by Dr. Lorne Tyrrell at the University of Alberta. Scientists in the Institute are known for their leading studies in virology, and the strength of their reputation is what led the pharmaceutical company, Glaxo Wellcome of Canada to provide the Institute with almost $7 million over the past eight years.



Funding Partners: The Medical Research Council of Canada, NHRDP, the Alberta Cancer Board, and the University of Alberta

ACHIEVEMENTS IN GENETIC RESEARCH

- New information on the relationship between the structure of genes and how DNA produces RNA
- Identification of chromosomal changes which underlie the development of childhood kidney cancer, called Wilms Tumor
- Collaborated with international investigators to find a gene which influences the development of an arthritis that afflicts young people, ankylosing spondylitis
- Identified hereditary factors in the cause and course of human cancers
- Discovered better methods to sequence DNA
- Discovered two human genes with an important role in controlling cell growth and morphology
- Identified a gene involved in the development of colon cancer
- New information about genes involved in controlling cholesterol levels
- Developed new microscope techniques to observe DNA and proteins
- New information on genes of a soil bacterium called *Streptomyces*, a bacteria used in the industrial production of antibiotics
- Insights into the genetics of glaucoma, cleft lip/palate, dyslexia, and herpes simplex virus
- Identification of a gene thought to be defective in myotonic muscular dystrophy
- New insights into how genes are switched on and off. When cells become cancerous, they lose the ability to switch genes on and off appropriately
- Development of genetic engineering techniques to produce a drug called streptokinase more cost effectively. This is a common, expensive drug given to heart and stroke patients
- Identification of genes controlling early development
- Information on gene regulation of a protein that influences heart cell response during recovery after ischemic heart disease
- Mounted an experiment in enzyme replacement therapy for inherited metabolic diseases
- Cloned and patented receptor genes for infection-causing bacteria, and developed antigens to test as vaccines
- Information on the genetic control of calcium-binding proteins which are key to most body processes, including proper functioning of blood vessels and heart muscles
- Successfully transplanted the insulin-controlling gene in liver, an important step in developing gene therapy for diabetes

Closing the Gap. . . Between Knowledge Finders and Knowledge Users

"Before, S.E.A.R.C.H. personnel often did not have the time to ask the right questions about health needs. S.E.A.R.C.H.'s high profile legitimizes research. I'm excited by the access to information we have, by the computer technology that links us, and by the opportunity to advance knowledge of community health. All of this contributes to bridging the gap between evidence and action."

Darlene Spelton, Coordinator, Health Information and Research, Lakeland Regional Health Authority, and S.E.A.R.C.H. Student

S.E.A.R.C.H.

Health professionals in RHA's throughout Alberta are learning to ask the right questions about our health system. They are the participants in a unique health research training program called S.E.A.R.C.H., short for Swift Efficient Application of Research in Community Health.

Asking the right questions translates into fiscal prudence for the 17 Regional Health Authorities created by Alberta Health to decentralize management of health care. The RHA's have identified timely research as a priority to provide information to help allocate health care dollars wisely and plan effective care programs. However, research is just one of many items on a long list of priorities. AHFMR responded to the need by creating the S.E.A.R.C.H program, the first of its kind in Canada.

In a seven-week course, health research experts taught the S.E.A.R.C.H. students how to access and appraise health research, and conduct some of their own. They learned how to identify local health needs, how to determine the most

The S.E.A.R.C.H. Group

efficient way to meet those needs by researching current and new practices, and how to use research findings to inform decisions and advise policy makers about local health issues. As well, students are undertaking two-year research projects based on local concerns such as injury prevention, early maternity discharge, and the costs of alcohol-related disease.

During the two years, they have access to each other and health research advisors at the Universities of Alberta and Calgary, via a computer network. Meanwhile, the rest of the country is keeping an eye on this innovative program, designed to empower the community with knowledge and skills so that, at some level, everyone can become a knowledge finder and user.

"Our staff have gained new skills and forged valuable networks. The knowledge they provide will help us develop research-based practices. Because of limited resources in all the regions, the provincial scope of the program gives us symmetry. We now have skills and resources to share with other regions so we're not duplicating our efforts.

Gilbert Tourigny, CEO,
Chinook Regional Health Authority

For information contact: Sharon Kalinka, Coordinator of S.E.A.R.C.H.

Funding Partners: AHFMR provided $1 million for the training program and computer link. Participants' salaries and job guarantees for two years were provided by the three organizations who employ the participants: the RHA's, Alberta Health, and the former Provincial Mental Health Board.

Dr. Dele Davies

PREVENTING INFECTION IN NEWBORNS

Calgary pediatrician Dr. Herbert "Dele" Davies has become a research champion for preventing a life-threatening infection in newborn infants. Women who carry *Strep B* bacteria, and often don't know it, can infect their babies during the birth process. The best way to screen and treat pregnant women is a complicated issue, so practice guidelines have been developed for physicians. Dr. Davies' survey has shown that some Alberta doctors are still not following the guidelines, sometimes for good reasons, and sometimes because they are unaware of them.

While following the response to *Strep B* guidelines in Alberta, Dr. Davies is educating lab technicians and doctors about recommended procedures. His work is an example of new efforts to make research findings available to health care providers.

FROM PENN TO COMPUTER

Every week, about 100 people suffer a stroke in Alberta. Only a handful receive care in Alberta's teaching hospitals. To relay information on stroke care to health care providers throughout Alberta, Dr. Andrew Penn developed a computer program called StrokeNet.

He also developed SYNAPSE, an on-line publishing program for the latest advances in medical information for health professionals. Participants in S.E.A.R.C.H. use JANUS, an off-shoot of Dr. Penn's program, for their research.

Dr. Penn is also a principal investigator in HEALNet, a national collaboration of academic centres and industry, devoted to creating information networks for Canadian health care.

NEW DISSEMINATION PROGRAM

Health care decisions will never be straightforward or easy, but getting evidence about what works and what doesn't is a start – even if the result is discovering there is no conclusive evidence on an issue.

AHFMR has mounted a new program to facilitate dissemination of health research findings to Alberta policy-makers, administrators, and health care providers. The goal is to promote a culture of evidence-based health care by building the Alberta capacity for dissemination through effective partnerships and pilot projects.

Activities include developing means of identifying which research findings are relevant and worthy of dissemination, determining the strategic communication pathways, media, and community partners available in the province, and finding the best ways to foster dissemination by other Alberta organizations.

ACHIEVEMENTS

AHFMR is one of three primary funders of the Alberta Health Knowledge Network, an electronic library with databases in medicine, biology, nursing, cancer, and health services administration. The Network is available to all Albertans.

Because of their expertise, Heritage researchers participate in reviewing evidence and creating national practice guidelines for physicians in areas such as cholesterol screening, caring for high risk cardiac patients, and treating anterior knee pain.

During 1993-96, AHFMR supported 57 national and international conferences and workshops in Alberta, providing a forum where researchers, health care administrators and health care providers exchange new information.

Between What We Know and What We Do in Health Services

What are the health care needs of Albertans?
What are the most effective programs?
How can they be most efficiently delivered and evaluated?

Health services research is essential to answer these questions, but doing quality research in the complex human laboratory of the community is a tremendous challenge. That's partly why the field is much less developed than biomedical research and there are fewer well-trained health researchers.

AHFMR has taken on the challenge of facilitating excellent health services research and supporting the growth of Alberta expertise. New personnel programs fund recruitment and training of health researchers from many health-related fields such as sociology, economics, and law, as well as experts in medicine, health administration and public health. The Foundation has also made its successful peer review and advisory system available for the administration of funds previously administered by Alberta Health. The innovative S.E.A.R.C.H. is another initiative which builds local capacity for health services research. (See page 28).

WOMEN'S HEALTH SERVICES

"If we are going to develop appropriate care that allows women to make decisions about their own health, we need a broad understanding of what is women's health. We need to look at it from traditional and non-traditional points of view, and consider all the influencing factors, from work conditions to family situations. The first step is to talk to women to discover their perceptions and experience of health in the social and cultural context," says Dr. Lynn Meadows.

Dr. Meadows is interviewing Alberta women aged 40 to 65 to gather such information. As a survey of broad health needs, this pioneering study exemplifies "population health research," carried out by a researcher who brings the sociologist's perspective to health issues. Dr. Meadows is one of the first Population Health Investigators supported by AHFMR.

When high-risk obstetrics was isolated at the Royal Alexandra Hospital in Edmonton, Dr. David Olson, Director of the U of A Perinatal Research Centre, set up a new satellite research program. The Capital Health Authority, the University of Alberta, and the Royal Alexandra Foundation have provided $1 million to support Perinatal and Women's Health Research.

In his own research lab, Dr. Olson recently discovered an enzyme that could be used to prevent pre-term labor.

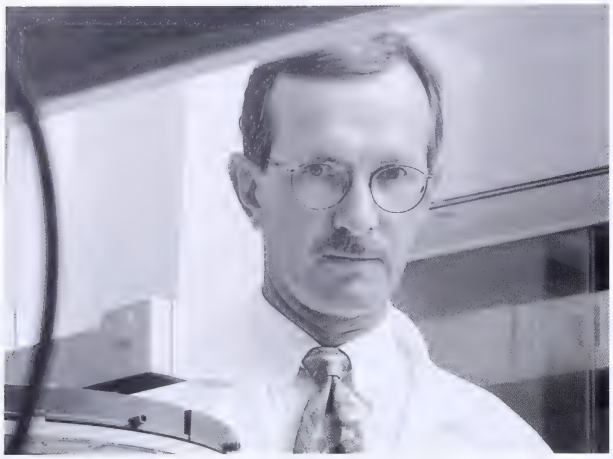
Cully Wilson

SENIORS BEHIND THE WHEEL

Cully Wilson laughs when he tells people he was a volunteer for a project on dementia and driving. Although Mr. Wilson is perfectly healthy, his participation in the normal control group of drivers gave psychology researcher Dr. Allen Dobbs valuable information about subtle differences between competent drivers and those whose mental abilities are impaired by illness. Surprisingly, Dr. Dobbs found that some people with early-stage dementia may retain basic driving skills. This is one reason why current driving tests designed for younger people do not effectively screen who is safe to drive.

Dr. Dobbs is developing a new test of driving skills in the elderly that will help keep competent older drivers like Mr. Wilson on the road and independent, while identifying other seniors who should no longer be driving. Physicians have asked for such a test because they are all too aware of the difficulties of making decisions without an evidence-based testing procedure.

Considering that more than 40 percent of dementia patients have a car crash within five years of diagnosis, the test is sorely needed.



Dr. Ted Tredget

In the past, 90% of North American hospitals used a whirlpool bath treatment, called hydrotherapy, to treat burn patients. That was before Dr. Ted Tredget and colleagues at the U of A Hospital discovered that hydrotherapy was causing more harm than good – patients were picking up serious infections from the stainless steel tubs. The Burn Unit stopped using hydrotherapy and reverted to the traditional use of silver nitrate creams. As a result, Burn Unit survival rates have improved and annual costs have shrunk by almost $500,000.

Health Services Research Projects

As of 1995, AHFMR administrates the Health Services Research and Innovation Fund on behalf of Alberta Health. The fund supports research on the organization, delivery, and quality of health services.

Projects supported include studies of:

- Screening for cervical cancer and for hearing in newborns
- Role of health facilitators in increasing urban Natives' access to health care
- Use of magnetic resonance imaging to predict who needs knee surgery
- Determining the nutritional needs of the elderly
- A program to encourage family doctors to practise preventive medicine
- Health status and rates of hospital use after health care restructuring
- Treatment options for congestive heart failure, sleep apnea, infants with respiratory problems, and the mentally ill
- Psychotherapy for breast cancer patients
- Laser treatment for prostate cancer
- Laparoscopic surgery for endometriosis
- Ethical guidelines for prolonging life with feeding tubes
- Ways to stabilize broken thigh bones
- Nutritional supplements for abdominal surgery patients
- Treatment for pregnant women with deep vein thrombosis
- Therapies for cardiac-related kidney disease
- Methods to identify incompetent elderly drivers

IMPROVING MENTAL HEALTH SERVICES

According to an Edmonton survey, one out of four people will suffer from a mental illness at some point in their lives. Alberta researchers supported by the Mental Health Fund are determined to bridge the chasm of ignorance by identifying mental health needs, and developing better drugs and effective psychotherapies. For example, Dr. Anthony Joyce is examining factors that affect the success of short-term psychotherapy. Dr. Heather Holley is identifying regional variations in suicide rates and relating them to possible influencing factors such as socio-economic status and age. Dr. Julio Arboleda-Florez is evaluating an innovative computer program that can track costs and outcomes of psychiatric care.

AHFMR administrates the Mental Health Fund on behalf of Alberta Health. Other projects supported include studies of:

- The effects of antidepressant drugs
- Mental health status and needs of the elderly, of former psychiatric patients, and of injured people unable to work
- Effectiveness of therapies for schizophrenia
- Ways to measure onset of mental illnesses
- Depression in women after experiencing a stressful event
- Patterns in recovery from gambling addiction
- Regional variation in suicide rates in Alberta
- Meaningful activity for the mentally ill
- Relationship between mood disorders and alcohol abuse
- Physiology of schizophrenia
- Effect of deep breathing on duration of asthma attacks
- Delirium in hospitalized psychiatric patients
- Causes of anorexia nervosa.

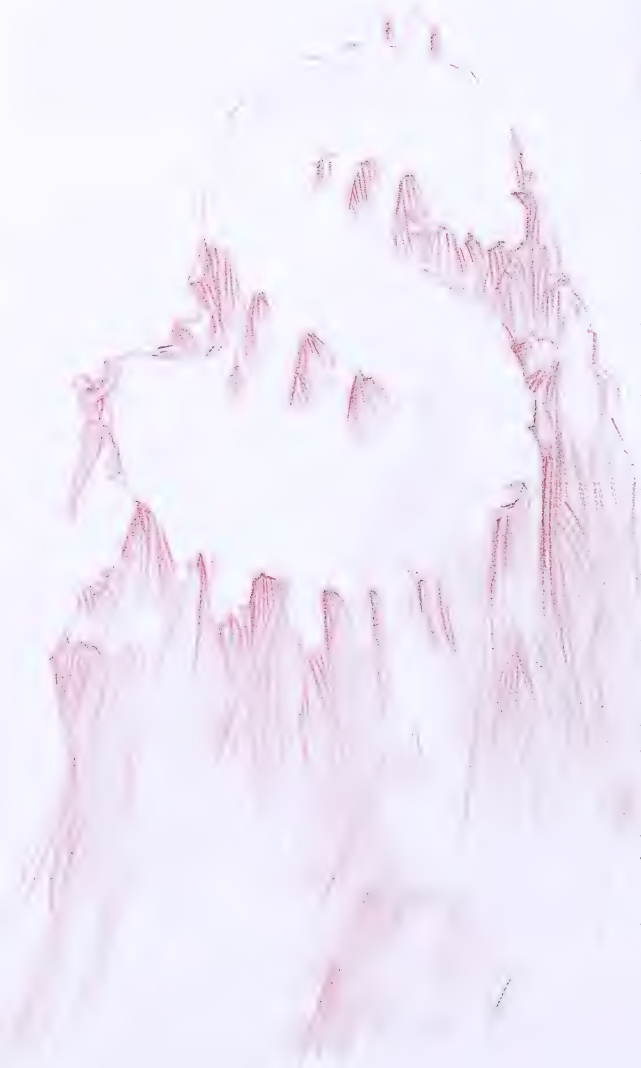
Is there a medical reason for some children's lack of attention? Attention Deficit Hyperactivity Disorder (ADHD) is difficult to define, because experts aren't sure what it is. Characterized by inattentiveness, impulsiveness and hyperactivity, if often results in extreme stress for all involved. Dr. Bonnie Kaplan and colleagues at the University of Calgary recruited more than 400 children to participate in a comprehensive study to look for the causes of ADHD.

STAYING HEALTHY

For information about attention deficit hyperactivity disorder, please call:
Children and Adults with Attention Deficit Disorder (CHHADD)
Calgary chapter: Susan LaFrance at (403) 225-1650
Edmonton chapter: (voicemail directory) (403) 988-3960
Provincial Mental Health Services Calgary: (403) 297-7196

For emergency mental health situations go to the nearest hospital.
For general information on mental health issues and research, please call: Calgary World Health Organization Collaborating Centre for Research and Training: (403) 268-9202
Canadian Mental Health Association, Provincial Office: (403) 482-6576

What We Want and What We Can Afford



Obviously, what we want is the best quality health care at affordable prices. Given the myriad of choices and the complexity of health care, policy-makers have a daunting task to help us get there. Fortunately, they have a powerful aid in the AHFMR Health Technology Assessment (HTA) Unit, led by Dr. David Hailey.

HTA bridges science and policy. It's the business of reviewing evidence world-wide on a "technology," defined as any device, therapy, or procedure used in health care. The evidence is appraised and analyzed to provide information on the technology's safety, efficiency, effectiveness, and its economic, legal, and ethical impact on health care. HTA provides information to decision-makers, who consider it along with all the other elements that determine public policy.

"HTA is only one input, and though in some cases it may be the primary input, in many cases the questions are part of very complicated policy matters, and relate to profound societal preferences," explains Dr. Hailey.

The HTA Unit responds to requests from Alberta Health and the Regional Health Authorities, but questions may also come from health administrators, professional bodies, and individual health care professionals. For example, the Unit is preparing a report on a surgical procedure to help control symptoms in Parkinson's patients who no longer respond well to drugs. Usually, the questions concern new technologies, but HTA also reports on evidence – or the lack of it – on the effectiveness and impact of routine treatments.

Alberta activity is coordinated with the Canadian Coordinating Office for HTA, and is closely linked to international HTA. For example, the Alberta Unit coordinated the first collaborative international HTA study, involving Canada, Sweden, Spain, and England, all members of the International Network of Agencies for HTA. The study examined whether mass screening of

"I love my work – HTA – because in the end we feel we are synthesizing evidence that exists and making some sense out of it in a way that can be used practically. I'm excited because there's a lot of room for positive change."

Deborah Marshall

HTA Reports Are Available On:

- Laser surgery for sleep apnea
- Ultrasound methods for measuring urine volume
- An experimental therapy for multiple sclerosis.
- Survey of alternative medicine practices.

menopausal women and drug therapy (hormone replacement and calcitonin) will prevent bone fractures in a significant number of older women. The report will be available in late 1996.

Dr. Hailey emphasizes that, ultimately, the impact of the HTA Unit will go beyond specific reports. "Ideally, we will be a catalyst in Alberta, encouraging others to take on their own assessment activities."

Adopting New Technologies

Introducing new technologies often raises health care costs. Ideally, effective and efficient new technologies are adopted rapidly, while undesirable technologies are not adopted, but that doesn't always happen.

Deborah Marshall is studying the factors influencing adoption of health technologies, so the knowledge can help their appropriate use. She brings her international experience in Health Technology Assessment (HTA) to her doctoral studies at the University of North Carolina. She is supported by an AHFMR health studentship.

THE VALUE OF TELEMEDICINE

Is telemedicine a cost-effective way to deliver specialized healthcare over distances? Dr. Rod Elford, an AHFMR Clinical Fellow, is convinced the answer is "yes", and hopes to prove it to others through his study of care delivered via telemedicine to patients in rural Newfoundland.

EVALUATING REHAB SERVICES

Dr. Allison McKinnon is evaluating delivery of rehab services in Alberta through the new Community Rehabilitation Program implemented by the Regional Health Authorities. Her analysis of outcomes includes cost, utilization, and client well-being. This study is funded by Alberta Health through the Health Services Research and Innovation Fund, administered by AHFMR.

Dr. Robert Reid

PATTERNS OF REFERRED CARE

The issue of specialty care – who should be referred for it and for how long – is a contentious one, with many implications for health care costs. Dr. Rob Reid is investigating the patterns of referred care for Alberta patients with newly diagnosed conditions. The study includes how referral patterns affect health care.

AHFMR and Alberta Health are funding Dr. Reid's research at the Johns Hopkins University School of Hygiene and Public Health in Baltimore, one of the world's leading public health institutions.

CROSSING THE GAP . . .

Between What We Can Do . . .

"Are we doing the right thing for the right patient at the right time?"

Dr. Sheila Malm

The question raises concerns about allocation of resources, quality of life, patient autonomy, and many other ethical issues in health care. Because these are matters of values, not science, there is seldom a single "right" answer but addressing them is crucial if we are to create the kind of health system we desire.

Dr. Sheila Malm, a Calgary family physician, is teaching medical students and physicians how to raise the question and examine alternatives with patients, who often know better than anyone what is best for them.

She explains: "Traditionally patient-doctor relationships have been paternalistic, where physicians make the decisions they believe are best for patients. Now we are moving towards giving patients information and helping them make the decisions they believe are best for them. We don't really know how patients make these decisions, like end-of-life decisions, and we need to understand that, so we can help them better.

"There was a public belief that science and technology could solve everybody's problem, that there would be no more illness, poverty, or whatever – which was never really promised – and now we're seeing disillusionment. People are saying, 'Yes, you can keep me alive on the ventilator forever but do I want that? I can get cancer treatments and live six months longer and be sick as a dog, but do I want that?'

"Suddenly people are looking at what is valuable and worthwhile and really expressing it."

After a year's study of ethics at the University of Chicago, Dr. Malm has returned to The University of Calgary, where she teaches ethics and maternity care. She also continues a collaborative study with Chicago researchers, aimed at teaching physicians about the decisions they and their patients will have to make about the new genetics. "Nobody is quite sure what's going to happen, and they feel quite overwhelmed," she says.

"I see training in ethics as a way to help physicians better understand their own values and beliefs, and understand something about society's values and their patients' values, so there can be better communication and more respect for patients."

Dr. Malm's study was supported by AHFMR, with additional funding from the 1995 Monnex: AMA Scholarship, the Canadian College of Family Practice, and the Women's Federation of Canada.

and What We Ought to Do

Timothy Caulfield

COMMERCIALIZING GENETICS

The genetic revolution has given us unprecedented hope for managing, curing, and preventing disease but, as with all powerful new technologies, we are mightily challenged to use the new tools wisely.

At this point, it appears technology is racing ahead of our ability to sort out the issues. What is appropriate and inappropriate genetic manipulation? Who owns genetic material and gene patents? Will people face discrimination in the workplace on the basis of genes? How many scarce health care dollars should be devoted to genetic services? Genetic research and its application to health care proceeds with alarmingly few policy guidelines about legal, ethical, and social issues and, not surprisingly, challenges have begun to appear in the courts.

University of Alberta lawyer Timothy Caulfield has begun critical studies on the commercialization of genetics. For example, he is investigating how patenting affects access to genetic services, information useful in Canadian policy-making.

"There's a lot of fear associated with the impact of commercialization on genetic services," he explains. "We're asking: 'How is commercialization good? How is it bad? If it is bad, how are we going to regulate against that and maintain the benefits?'"

Last year, Mr. Caulfield and Dr. Bartha Maria Knoppers, an AHFMR Visiting Scientist from the University of Montreal, completed a survey of norms and practices among genetics professionals. It reveals that researchers and practitioners are confused and uncertain about many issues related to genetic services.

Mr. Caulfield is an AHFMR Population Health Investigator at the University of Alberta Health Law Institute. His study of commercialization is part of a larger research program aimed at identifying what influences allocation of genetic services, the rights and interests of various stakeholders, and the legal frameworks needed to ensure appropriate use of services. He is also examining legal issues in health reform.

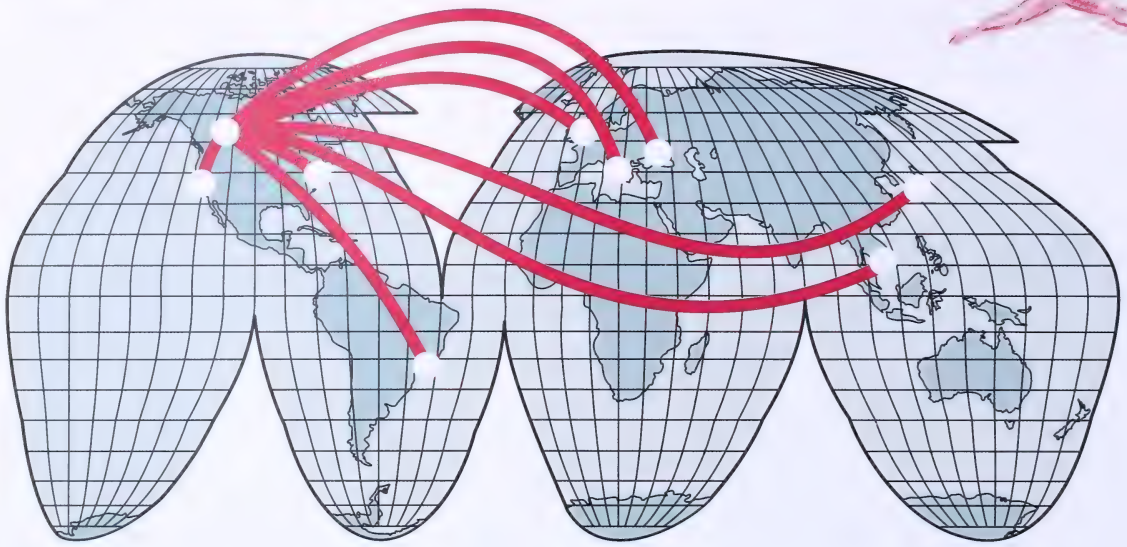
For health ethics information contact: The Provincial Health Ethics Network
Edmonton: 1-800-472-4066 Calgary: 1-800-472-6132

Ethical Safeguards

All research supported by AHFMR must pass stringent ethical review within the host institution or community organization, and must meet national standards to safeguard human rights, animal rights, and precautions against biohazards.

Funding Partners: University of Alberta, Canadian Genome Analysis and Technology Program, Health and Welfare, Canada

CROSSING THE BORDER BETWEEN . . .



Alberta and the Rest of the World

Dr. John Wallace

Nearly two million Canadians take some form of nonsteroidal anti-inflammatory drugs (NSAIDS), such as Aspirin. Along with the relief from fevers, arthritis and pain, NSAIDS have a dark side. Chronic use can cause stomach ulcers.

Heritage researcher Dr. John Wallace and Italian researchers may have found a way to deliver even more pain relief without the stomach irritation of NSAIDS. Dr. Wallace and his colleagues have received $10 million from Apax, a European venture capital company to refine and test his NONSAIDS on humans. If clinical trials are successful, a new anti-ulcer pain reliever could be in drugstores worldwide within five years.

Dr. Wallace's discovery earned him the 1995 Michael Smith Award for Excellence, the top award of the Medical Research Council of Canada.

Alak Hamayed,
Fort McMurray Safety Child

The community of Fort McMurray, Alberta has made a commitment to safety and health.

As a result of that commitment, the World Health Organization chose Fort McMurray as the site of the Fourth International Conference on Safe Communities. The conference, sponsored in part by AHFMR, hosted delegates from 26 countries to discuss occupational, agricultural, and traffic safety, and injury prevention.

As the first baby born in Fort McMurray during the conference, Alak Hamayed was designated "the safety child."

Fort McMurray was the first North American city inducted into the World Health Organization's Network of Safe Communities.

The conference is one of 55 national and international conferences AHFMR supported in Alberta.

INTERNATIONAL COLLABORATIONS

Dr. John Wallace is one of many Heritage researchers in demand for their expertise. Because many Alberta scientists are world authorities in their fields, researchers throughout the world want to collaborate with them. Here are a few more examples:

Specialists throughout the world send **Dr. Marvin Fritzler** patient samples for sophisticated analysis of autoantibodies related to lupus, scleroderma, and other autoimmune diseases.

Researchers in the U.S., Canada, Sweden, and Italy ask **Dr. Sam Schurch** to test their artificial surfactants with his innovative equipment that mimics a baby's lung. Surfactants are the life-saving compounds given to premature infants who lack the normal substance which lines airways and air sacs in the lung. Improving surfactants would help more tiny infants survive, and lower costs for the health care system.

Dr. James Fewell's expertise in investigating the mechanisms of crib death has attracted collaborators in the U.S. and Australia.

When Heritage researchers need to add to their expertise, they go to the best labs in the world to get it. For example, **Dr. Randy Read** visited Japan to use the world's best equipment for viewing crystals, a stage in x-ray crystallography, a technology for modelling interactions between drugs and molecules in the body. The rest of the world is watching Dr. Read's crystallography work, directed toward developing a better vaccine for pertussis.

Dr. Brian Andrews, Head of Rehabilitation Technology at the Glenrose Hospital, collaborates with university and industry researchers in Australia, Britain, and the U.S. to refine his innovative electrical implanted system for helping paralyzed people move. Dr. Andrews is also part of the U of A's Neuroscience Research Group, whose AHFMR members alone have attracted $3 million in outside funding over the past three years.

Industry also asks him to test their new technologies.

Prof. Alan Maynard is one of many international visiting experts AHFMR funded to advise Albertans in research and health, as part of the Visiting Scientists program.

"The big problem is that, when introducing new therapies or techniques, doctors often bring in economic issues too late."

Prof. Alan Maynard, Economist
Nuffield Provincial Hospital Trust, London, England

AHFMR's advisory network makes experts from Canada and around the world available for advice on programs and activities.

SCIENTIFIC ADVISORY COUNCIL (SAC)

Dr. Harold L. Atwood
Professor, Physiology & Zoology
Director, MRC Group in Nerve Cells & Synapses
University of Toronto (until July 5/95)
Toronto, Ontario

Dr. John Bell
Nuffield Dept. of Clinical Medicine
John Radcliffe Hospital
Headington, Oxford
U.K.

Prof. H. John Evans
MRC Human Genetics Unit
Western General Hospital
Edinburgh, Scotland

Dr. Abraham Fuks
McGill Cancer Centre
Montreal, Quebec

Dr. Jennifer Lund
Dept. of Visual Sciences
Institute of Ophthalmology
London, U.K.

Dr. Barry C. McBride
Dean, Faculty of Science, UBC
Vancouver, British Columbia

Dr. Jonathan Meakins
Professor & Head, Dept. of Surgery
Royal Victoria Hospital
Montreal, Quebec

Dr. Edward B. Perrin
Professor and Chair, Dept. of Health Services
University of Washington, Seattle

Dr. I Barry Pless
Prof. of Pediatrics & Epidemiology
Montreal Children's Hospital
Montreal, Quebec

Dr. Daniel Porte, Jr.
Assoc. Chief of Staff for R&D
Head, Division of Endocrinology & Metabolism
University of Washington, Seattle

Dr. Carol Prives
Dept. of Biological Sciences
Columbia University, New York (until Sept. 12/95)

Dr. Bishnu D. Sanwal
Professor, Dept. of Biochemistry
University of Western Ontario (until Oct. 10/95)
London, Ontario

Dr. Gary L. Stiles
Chief, Division of Cardiology
Duke University Medical Center
Durham, North Carolina

HEALTH ADVISORY COMMITTEE (HAC)

Dr. Lawrence W. Green
Professor and Director
Institute of Health Promotion Research
Vancouver, British Columbia

Dr. Robert S.A. Hayward
Assistant Professor
Department of Medicine
McMaster University Medical Centre
Hamilton, Ontario

Dr. Don Iverson
University of Colorado School of Medicine
Denver, Colorado

Dr. Robert S. Lawrence
School of Hygiene and Public Health
Johns Hopkins University
Baltimore, Maryland

Dr. Edward B. Perrin
Professor and Chair, Dept. of Health Services
University of Washington, Seattle

Dr. Peter Scholefield
Coordinator, Academic Affairs
Samuel Lunenfeld Research Institute
Mount Sinai Hospital
Toronto, Ontario

Prof. Trevor Sheldon
Director, National Health Service
Centre for Reviews & Dissemination
University of York, Heslington
York, U.K.

Professor Leif Svanström
Karolinska Institutet
Dept. Public Health Sciences, Social Medicine Div.
Sundbyberg, Sweden

Dr. Peter Tugwell
Head, Dept. of Medicine
University of Ottawa
Ottawa, Ontario

"I am very impressed with the responsiveness of AHFMR in addressing the changing societal and health needs of Albertans. The recent implementation of a program in health research, designed to assist the Province in refining the quality and infrastructure of its health care delivery system, is an outstanding example of public leadership.

Through the judicious use of its resources, the Foundation has placed Alberta in a national and international leadership position in both biomedical and health services research."

Dr. Ed Perrin, Professor
Dept. of Health Services,
University of Washington

How Do We Know We're Bridging the Gap?

AHFMR'S SUCCESS IS EVIDENT:

Heritage-supported scientists win national and international acclaim for their advances.

Universities attract more bright people who want to work with Alberta scientists.

Heritage researchers receive millions of research dollars from private and public sources.

Specialized expertise is made available to Alberta physicians and their patients.

Findings from research are incorporated into patient care.

Other research agencies endorse our leadership.

"As a result of AHFMR support, we are able to recruit top scientists who, in turn, are instrumental in attracting other students and scholars. Working together, these individuals help make the University of Alberta a leading health research and teaching centre. They successfully compete for external funding to support their research, attracting millions of dollars to the province. Clearly, all Albertans benefit from this activity – demonstrating once again that research makes sense."

Dr. Rod Fraser, President
University of Alberta

"With its focus on excellence, AHFMR provided the impetus for attracting top-notch investigators who have consistently conducted leading-edge research. The presence of these brilliant investigators has also resulted in more funding from the Medical Research Council of Canada to support their research and contributed to the development of industries stemming from that research. MRC funding alone, simply could not have brought Alberta's health research status to the pinnacle it has reached. The decision by the provincial government of the day to establish AHFMR has, over the years, brought Alberta to the forefront in health research and medical education in Canada. MRC is proud of its close association with AHFMR."

Dr. Henry Friesen, President
Medical Research Council of Canada

What Others Say About Us . . .

"As one who has recently returned to Alberta, I am well aware of AHFMR's outstanding reputation as a Canadian leader in developing innovative research programs. The presence of so many talented medical researchers at The University of Calgary can be attributed to our funding partnership with the Foundation. We are proud of the innovative contributions these outstanding University of Calgary scientists are making to basic science, patient care, commercialization of discoveries, and medical education – not only for the benefit of Albertans, but all Canadians."

Dr. Terry White, President
University of Calgary

"I was truly amazed when I discovered the nature and extent of the AHFMR programs. This must be one of the most comprehensive, coordinated health research training and development support programs in the world. Not only will this position Alberta as a leading centre for health research, the investment will contribute to the advancement of health care in Canada and elsewhere."

Dr. Trevor Sheldon, Director,
National Health Service
Centre for Reviews and
Dissemination,
York University, England

AHFMR researchers are well-represented in the national Networks of Centres of Excellence. The protein engineering Network, one of five Centres in the biological sciences, is headquartered at the University of Alberta. Other Heritage researchers are members of the Canadian Bacterial Diseases Network, the Neuroscience Network, the Respiratory Health Network, the Centre for Genetic Diseases Network, and the Health Evidence Application and Linkage Network.

SUCCESS IN THE CLINIC, THE LAB, AND THE MARKETPLACE

Sleep apnea is sometimes called the "snoring disease" because sufferers usually snore vigorously, but it's no laughing matter. About seven percent of North Americans have sleep apnea, a potentially life-threatening condition. Breathing stops briefly during sleep, so that rest is disturbed and dangerous daytime sleepiness occurs. Fortunately, many North Americans have their sleep apnea under control, thanks to world authority Dr. John Remmers.

Dr. Remmers' work demonstrates the full range of benefits AHFMR-supported scientists bring to Albertans. In basic research, he discovered some of the mechanisms behind the sleep apnea, and founded the Alberta Lung Association Sleep Disorder Centre at The University of Calgary and the Foothills Hospital.

Then he developed "Tranquility," a sleep mask to correct breathing, which has been successfully marketed throughout the world. More patients can now manage their disease, and The University of Calgary shares revenues from commercialization of the device.

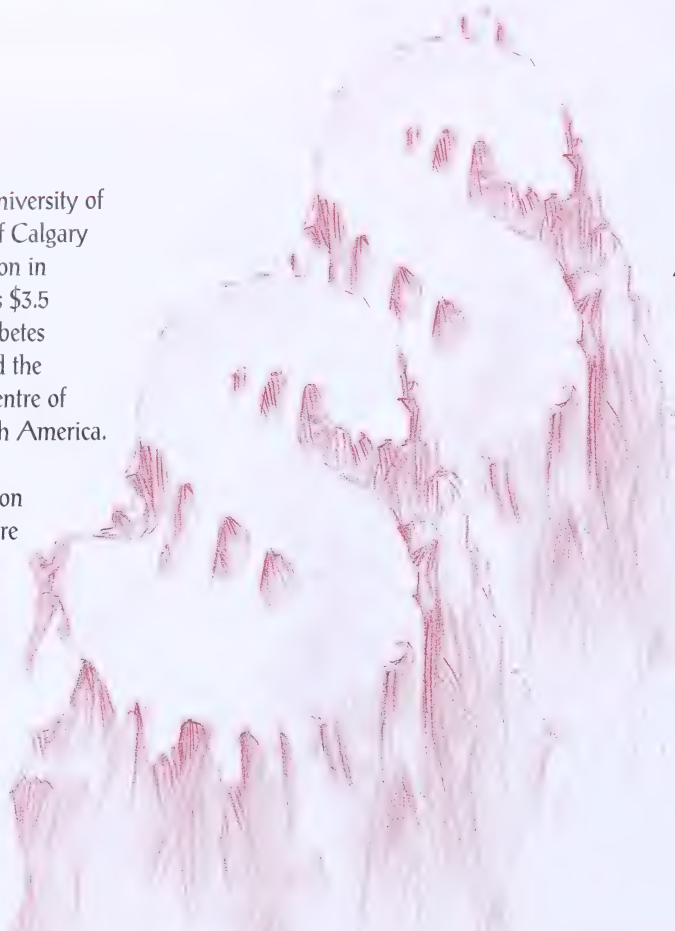
Dr. John Remmers

Dr. Remmers' next innovation could also reduce costs of care. Sleep apnea has been complicated to diagnose, involving an overnight stay in a sleep lab. Dr. Remmers devised "SnoreSat," a small instrument for at-home diagnosis. This device is also being commercialized.

Lastly, Dr. Remmers has provided leadership in research on patient well-being and quality of life at the Foothills Hospital and The University of Calgary.

Funding Partners: The Alberta Lung Association, the Calgary Regional Health Authority, Alberta Health, the Medical Research Council of Canada, The University of Calgary

BECAUSE OF THEIR EXCELLENCE, HERITAGE RESEARCHERS ATTRACT MORE THAN $2 FOR EVERY AHFMR DOLLAR INVESTED.



Diabetes researchers at the University of Alberta and the University of Calgary attracted more than $23 million in outside funding. This includes $3.5 million from the Juvenile Diabetes Foundation, which designated the U of A diabetes team as a Centre of Excellence, one of six in North America.

Dr. Henk ter Keurs' research on the mechanisms of heart failure earned him Canada's first Merck Frosst Professorship in Cardiovascular Research at The University of Calgary. The Merck Frosst funding of $750,000 over five years was matched by the Medical Research Council of Canada under the MRC/PMAC Health Program.

The Glaxo Heritage Research Institute at the University of Alberta has received $7 million from Glaxo Wellcome Canada Inc., funding given on the strength of Dr. Lorne Tyrrell's leadership and reputation in infectious diseases research. He has also attracted prestigious Heritage-supported researchers to join the Institute. The Institute is also supported by the University, the Government of Alberta, the Medical Research Council of Canada, NSERC, and many other sources.

OTHER NOTABLE SUCCESSES:

- Cancer researchers at the U of A and the U of C received more than $18 million in outside funding.
- Neuroscientists at the U of A and the U of C received more than $23 million in outside funding.

THE WORLD APPLAUDS

International Award Winners

Dr. David Brindley: Fournier Pharma-CLC Award in Artherosclerosis Research Communication

Dr. William Colmers: 1994-96 Pharmacology Grantee Award from Eli Lilly and Company

Dr. Paul Kubes: 1995 Young Investigator Award of American Gastroenterology Association

Dr. Grant McFadden: 1995 Inductee into Who's Who in Science and Engineering

Dr. Naweed Syed: Alfred P. Sloan Research Fellowship

Dr. Henk ter Keurs: Canada's First Merck Frosst Professor in Cardiovascular Research

Dr. Dennis Vance: Co-winner of the 1995 Heinrich Wieland Prize

National Award Winners

Dr. Lou Agellon: 1995 Canadian Lipoprotein Conference-Bristol Meyers Squibb New Investigator

Dr. Robert Bell: Multiple Sclerosis Society of Canada's Career Development Award & Multiple Sclerosis Society of Canada's Victory Project Award

Dr. Marvin Fritzler: 1995 Distinguished Clinician Scientist Award from Canadian Society for Clinical Investigation

Dr. James McGhee: G. Malcolm Brown Award from Medical Research Council of Canada

Dr. Jon Meddings: Young Investigator Award from Canadian Association of Gastroenterologists

Dr. Quentin Pittman: Medical Research Council of Canada Senior Scientist Award

Dr. Susan Rosenberg: 1995 William E. Rawls Award from Eli Lilly

Dr. Susan Rosenberg: National Cancer Institute of Canada & 1996 Young Scientist Award of the Genetics Society of Canada

Dr. Robert Ryan: 1995 Merck Frosst Prize awarded by the Canadian Society of Biochemistry and Molecular Biology

Dr. Matthew Spence: 1995 Distinguished Service Award of the Canadian Society for Clinical Investigation

Dr. Diane Taylor: 1995 Boehringer Mannheim CSM Award from the Canadian Society of Microbiologists

Dr. John Wallace: 1995 Michael Smith Award of Excellence from the Medical Research Council of Canada & First Chair of the Crohn's and Colitis Foundation of Canada for Intestinal Disease Research

Dr. Zemin Yao: 1993-94 McDonald Scholarship from Heart and Stroke Foundation of Canada

Provincial Award Winners

Dr. Tessa Gordon: 1993 Killam Annual Professorship, University of Alberta

Dr. Paul Kubes: Distinguished Achievement Award, University of Calgary

Dr. Jonathan Lytton: 1995 Calgary Herald Young Investigator Award

Dr. Karl Riabowol: Distinguished Achievement Award, University of Calgary

Dr. Dennis Vance: 1992-93 Killam Annual Professorship, University of Alberta

Dr. Garth Warnock: 1992-93 Killam Annual Professorship, University of Alberta

Research Chairs

Dr. Brian MacVicar, Ciba-Geigy Chair in Schizophrenia Research, funded by Ciba-Geigy Pharmaceuticals Canada Ltd., Schizophrenia Society of Alberta and The University of Calgary

Dr. John Wallace, First Chair in Intestinal Diseases Research, funded by Crohn's and Colitis Foundation of Canada

Dr. John Reynolds, the Jessie Boden Lloyd Professorship of Immunology Research, funded by the Jessie Boden Lloyd Endowment

Dr. Dean Befus, Astra Chair in Asthma Research, funded by Astra Pharmaceuticals Inc.

Dr. Wayne Giles, Heart and Stroke Foundation of Alberta Chair in Cardiovascular Research, funded by the Heart and Stroke Foundation of Alberta

Dr. Henk ter Keurs, First Canadian Professorship in Cardiovascular Research, funded by Merck Frosst Canada Inc.

. . . more applause

Dr. Diane Taylor

KEEPING ONE STEP AHEAD

What is it like to win a prestigious award for lifetime contribution to science?

"It was an important honor, indeed," says Dr. Diane Taylor, Heritage medical researcher and 1995 recipient of the Boehringer Mannheim Canadian Society for Microbiologists Award for lifetime contribution to research in microbiology. "It meant a lot to me because it was awarded by my peers in microbiology," she says.

Dr. Taylor's award recognized her work in an area of growing concern: antibiotic resistance. Bacteria are becoming resistant at an alarming rate. In fact, most disease-causing bacteria have a variant type that resists a least one of the antibiotics available on the market.

Dr. Taylor studies resistance to tetracycline, a once commonly used antibiotic. Somehow, tetracycline alters protein activity, but researchers don't know how this happens.

"If we can figure this resistance mechanism out, we might be able to get a better handle on how tetracycline should be modified," says Dr. Taylor.

"There are only a number of ways we can beat antibiotic resistance: being careful with the drugs we have, trying to invent new drugs, and improving sanitary conditions to stop the proliferation of bacteria," says Dr. Taylor. "I think bacteria are clever enough to figure out some way around everything we design. I don't think we're ever going to find something that's magic. I believe the answer lies not in trying to defeat bacteria, but keeping one step ahead of them."

Dr. Taylor also investigates the genetics of *Helicobacter pylori*, a major factor in stomach ulcers and gastric cancer.

Funding Partners: Medical Research Council of Canada, Natural Sciences and Engineering Research Council, National Centres of Excellence, Glaxo Wellcome Canada Inc., the Canadian Bacterial Diseases Network, Alberta ATRT, and the U of A

CROSSING THE GAP BETWEEN

The Lab and the Market Place

In medical research, first comes the discovery, then often the discovery business – technology commercialization. Albertans are succeeding in both.

Innovations coming out of Alberta labs are being successfully commercialized in the province, creating new technologies for health care and significantly boosting Alberta's economy. New companies have been founded on the innovations developed in Alberta or licensed to other companies throughout the world.

The AHFMR Technology Commercialization (TC) Program provides funding to Alberta-based entrepreneurs or researchers with a health-related technology judged to be commercially promising by outside experts and a review committee. Up to $175,000 is available to support people in the early stages of commercialization when technical feasibility, market potential and protection for intellectual property are established. After the early stages are successfully completed, up to $500,000 is available for entrepreneurial companies, through provincial TC dollars provided under the Medical Innovation Program, which is partially funded by Alberta Lotteries. This later stage funding is repayable, based on future sales.

TC funding has assisted small businesses like Carol White's wheel chair back company in Red Deer, and international businesses like Isotechnika, taking on the world with its system for analyzing drug compounds.

Linda Humphreys, Director of the TC Program, emphasizes it does not duplicate the role of venture capitalists or other organizations such as the Medical Research Council of Canada or technology transfer offices in Alberta universities. She explains, "Some innovations can be commercialized quickly, but many require years and millions of dollars to be developed to the stage where they can become truly commercial. We work to bring all the needed players and expertise to the table."

Dr. Robert Foster and Dr. Richard Lewanczuk

Pharmaceutical companies around the world want Isotechnika's technology to work for them. Isotechnika Inc. is the Edmonton health care company Dr. Robert Foster and Dr. Richard Lewanczuk created on the strength of a technique for analyzing organic compounds and modifying them. For example, the company is analyzing antibiotics and high blood pressure drugs, and altering them for more effectiveness.

The Technology Commercialization Program supported Isotechnika during early stage commercialization. In two years, the company grew from two to 40 employees, and 1995 revenues exceeded $1 million.

"In the business of science, the opportunity is staggering," says Dr. Foster.

TC Program Collaborators: National Research Council of Canada, Alberta Research Council, Industry Liaison Office (U of A), University Technologies International Inc. (U of C)

Achievements:

Funded 53 projects for a total of $3,832,938.

Innovations Funded include:

- Medical devices such as bionic glove, haemostatic compression device, sleep apnea mask, dental laser
- Software for improved research, training, including diagnosis and treatment of disease, protein conformation, DNA analysis, hazardous material handling, computer access for the disabled, patient management system for dialysis
- Diagnostics for earlier and more reliable detection of disease, including whooping cough, infertility, and hearing problems
- Pharmaceuticals for the more efficient and effective treatment of HIV, herpes, MS, TB, HUS, hypertension
- Products for the maintenance of health, including a fruit laxative, turning bed, stuttering analysis

Activities Funded Include:

- Establishing intellectual property protection through patents, copyright or trademarks
- Developing technology to the prototype stage
- Conducting clinical trials and testing
- Marketing and sales development

Laimons Plumite

ELECTRONIC GLOVE

Laimons Plumite has electrified his life to make it a little easier. Here he demonstrates an early version of a computerized electronic glove that gives some mobility to his paralyzed hand. The glove is the brainchild of U of A Heritage Scientist, Dr. Arthur Prochazka, who has translated his expertise in electrical stimulation of paralyzed muscles into therapeutic devices for patients.

The glove is the prize product offered by Neuromotion Inc. the thriving spin-off company Dr. Prochazka and colleagues founded with a Canadian venture capital company and some initial support from the TC Program. Since then the company has attracted more than $6 million from investors.

TREATING HAMBURGER DISEASE

A drug called Synsorb Pk could some day soon rescue victims of hamburger disease caused by *E. coli* bacteria. Related experimental drugs could be the answer to traveller's diarrhea and antibiotic-associated diarrhea. The drugs are the hot properties of Synsorb Biotech Inc, the Calgary firm with a technology that can absorb toxins secreted by bacteria.

TC support for clinical trials of Synsorb Pk was critical in taking it through the regulatory process, on the way to the marketplace.

TRAINING THE RIGHT EXPERT

For a successful biotechnology industry in Alberta, science must marry business. AHFMR is helping along this marriage with the newest addition to the Technology Commercialization Program, the Internship Program. Under the program, University Technologies International Inc., The University of Calgary company responsible for technology transfer, and the Industry Liaison Office at the University of Alberta each have a business graduate intern funded by AHFMR.

The interns will immediately enhance service to university researchers who have discoveries with commercial potential, and in the long term, interns are part of the growing expertise Alberta needs to capitalize on its scientific excellence.

CROSSING THE GAP . . .

Between Today and Tomorrow

By supporting hundreds of students each year, AHFMR provides young Albertans with research training in top labs, and ensures a supply of bright scientists for the future.

Health Economics

How do financial and other incentives affect physicians' decision-making when choosing among treatment options for a patient?

Jim Smythe, an award-winning economics graduate from the University of Alberta, hopes to have some answers. AHFMR is supporting his graduate studies at the National Health Service Centre for Reviews and Dissemination, at the University of York, England.

Dr. Janet Ronsky

Breaking the Stereotype

Dr. Janet Ronsky is one of many AHFMR doctoral students who have won honors for their research. As a woman with an engineering degree, she not only breaks down outdated stereotypes, she does it with excellence. Her work on the use of magnetic resonance imaging to identify knee problems earned her the first *Calgary Herald* New Investigator Award and the 1994 Canadian Biomechanics New Investigator Award.

ACHIEVEMENTS:

From 1993-96 AHFMR supported 170 full time students and almost 600 summer students, many of them just completing their first year of university. AHFMR provides an Award of Excellence in the seven regional school science fairs, and conducts a program of lab visits and science presentations to junior and senior high students.

Second-hand Smoke

Once again, second-hand smoke is a culprit in disease and increased health care costs. U of C graduate student Carol Bischoff has shown that pre-school children extensively exposed to second-hand smoke at home are much more likely to have ear infections than children in non-smoking homes.

McLeod Health Research Scholarship

In 1994, Reuben Harris became the first recipient of the Dr. Lionel E. McLeod Health Research Scholarship, honoring the founding President of AHFMR. Mr. Harris and his supervisor, Dr. Susan Rosenberg, are challenging traditional thinking about how cells mutate. Their innovative work could explain how some cancers begin.

The McLeod Health Research Scholarship is given to an outstanding student at the Universities of Alberta, Calgary, or British Columbia for research related to human health.

WISEST Student

"I realized that you must be very patient to work in research. Frustration can especially set in when you don't get any results or when your results are unclear. Despite all of this, research is still very interesting," says Julie Monfette.

Julie, a grade 11 student, spent the summer of 1995 learning about cell activity and atherosclerosis in Dr. Alexandra Lucas' lab at the U of A. AHFMR sponsored Julie's research experience under the U of A Women in Science, Engineering and Technology (WISEST) program for high school students.

Recovering from Brain Injury

Why do some men recover more quickly from brain injury than women? Dr. Margaret Forgie, a Postdoctoral Fellow at the University of Lethbridge, is investigating this as part of her research on what happens in the brain following damage. She has evidence sex hormones play a role in the recovery process.

STAYING HEALTHY

For information about the effects of second-hand cigarette smoke, please call: Action on Smoking and Health, Edmonton: (403) 492-2344

SCIENTISTS AND THE PUBLIC

ALBERTANS RIDE THE HIGHWAY TO HEALTH

Albertans were invited to hitch a ride on the Information Highway to Health during the spring of 1996. Over 200 people in Camrose and Fort McMurray attended presentations on how to use the Internet to search for health information. The presentations, which were sponsored by AHFMR and Telus Health Solutions, were given to high school biology students, health care personnel and the general public.

THE FUTURE OF MEDICINE

According to junior and senior high school students, Albertans may someday use the services of a robotic doctor, a virtual surgeon or a gene therapist, or have virtual surgery. The students responded to AHFMR's challenge of describing medicine in the year 2025. Winning students from Northern Alberta and Southern Alberta received $200 and a day in a Heritage medical research lab. A similar contest was also run on CBC radio for adults.

LAND LIKE A CAT

Can you land like a cat? Albertans got the chance to see if they could, during the AHFMR sponsored *Land Like a Cat* exhibit at the Edmonton Space and Science Centre and the Alberta Science Centre in Calgary. The exhibit incorporates medical research, science and health education, and most of all, fun.

SCIENCE AND THE MEDIA

In the summer of 1995 Marianne Kulka, a microbiology student from The University of Calgary, helped bridge the gap between science and the media while reporting for the *Calgary Herald*. Marianne spent 12 weeks as AHFMR Media Fellow and learned that communicating science to the public isn't always easy.

The goal of AHFMR's Media Fellowship program is to enhance the quality of science coverage and to foster an effective relationship between the science community and the media. One or two students are supported each year.

DEPRESSION, ANXIETY AND FEAR

Everyone gets depressed sometimes, but what is normal, and what is illness? In 1995, AHFMR visiting lecturer Professor Isaac Marks and Calgary psychiatrist Dr. Julio Arboleda-Florez gave a public presentation in Calgary on the topic. The AHFMR sponsored event was attended by over 400 people.

For information on Alberta medical research and AHFMR public events, please see:

- AHFMR Newsletters
- AHFMR Website: http://www.sas.ab.ca/ahfmr

Scientific and Financial Information

Note that this document serves as the Triennial Report for 1992-95, and as the Annual Report for 1995-96, so two sets of statistics are included, along with the 1996 Financial Statements. All numbers refer to the fiscal year, ending March 31.

AHFMR ENDOWMENT

1 What is our endowment?

The Alberta Heritage Foundation for Medical Research Endowment Fund was established in 1980 to finance the objectives of the Foundation – to establish a long term, balanced program of medical and health research for the benefit of the health of Albertans. The Fund operates under the authority of the Alberta Heritage Foundation for Medical Research Act. The initial investment was $300 million.

2 How is it managed?

The Endowment Fund is managed by Alberta Treasury. The investment policy was developed over a number of years by Alberta Treasury in co-operation with the AHFMR Board. The investment policy takes into account the expected conditions in the capital markets, the need for prudent investments, and a sustainable long-term spending program by the Foundation. The investment strategy under this policy is managed by the Investment Management Division of Alberta Treasury. The fund contains a diversified holding of Canadian investments along with equity investments in a number of international markets.

3 How do we decide how much we need to support our programs each year?

AHFMR executives develop long-range projections, based on Trustee decisions about maintaining current programs and developing new ones. These projections reflect the number and cost of investigators for each program, related expenses for establishment and infrastucture support programs, and the anticipated value of the endowment. Annual budgets are then developed from this long-range projection.

4 Why do actual expenditures sometimes vary from the budget?

Budgets are based on estimates of quality and number of applications for programs and the probable results of the review process, using historical experience and other relevant information. Actual expenditures may vary from the budget, depending on the quality and number of applications received and approved. (Excellence is the primary criterion for funding proposals.) In addition, the Foundation responds to needs as they arise in the community and unforeseen opportunities may result in increased spending.

5 How do we determine how much to transfer from the endowment to cover our budget?

Foundation management works with Treasury in developing long-term investment forecasts and strategies to ensure sufficient cash to fund current operations, while maintaining the value of the endowment by providing sufficient reinvestment of income to ensure future commitments can be met. To provide this balance between current needs and long-term goals, the Trustees have adopted a guideline for how much can be transferred each year.

This guideline recognizes that annual income to the endowment could vary drastically, depending on the performance of financial markets in which investments are made. To protect the programs of research from suffering dramatic cutbacks should there be years of significant poor returns, the guideline has two components.

Continued . . .

The suggested maximum transferable to the Foundation from the Fund in any year is 70% of the previous year's expenditures, plus 30% of 5% of the opening balance of the endowment. This is a refinement of the commonly used 5% rule for endowments which states that, to fund current programs and maintain the potential to fund into the future, only 5% of the value of an endowment should be spent annually.

6 What is the investment strategy for the endowment?

Due to these relatively high cash requirements to fund annual expenditures, the portfolio is structured to generate a high level of current income with a high degree of certainty. The current portfolio provides for the spending requirements plus growth to cover inflation, with a reasonable margin of safety. This margin of safety is called income coverage and it has varied from .95 to 1.3 times the cash required. The estimated cash income coverage from fixed income coupons and stock dividends for 1996/97 is 1.3 times the actual amount required, or $39.5 million from the following sources.

Portfolio Investments	Estimated Annual Book Income
	$ Millions
Cash & short term	2.7
Fixed income – long term	27.7
Equities	9.1
Total	**$39.5**

Cash requirements: 31.0
Income coverage: 1.3 times

Total investment income, including capital appreciation, was $62.9 million for 1993/94, $57.6 million for 1994/95, and $65.5 million for 1995/96. Endowment income for 1996/97 is estimated at $57 million. Of the $57 million, $39.5 million will be in current cash income and the balance will be in capital appreciation.

In order to generate this income, Treasury has developed a target asset mix for investments in short term, fixed income and equities. These investments are managed approximately 80% directly by Treasury and 20% by international and U.S. managers.

7 How is Fund performance evaluated?

The Investment Management Division Strategy Committee of Alberta Treasury regularly reviews and benchmarks asset classes, and monitors the performance of fund managers. Treasury meets regularly with Foundation management, and reports fund performance to AHFMR Trustees.

How does the AHFMR decide who to fund?

All final decisions about people and projects supported by AHFMR are made by the Trustees, who weigh the mandate to support a balanced program of research that meets standards of excellence against available income, considering that a portion of it must be added to the endowment to conserve purchasing power for the future.

WHO ADVISES THE TRUSTEES?

The AHFMR Board of Trustees and executive rely on advice from people in the international, national, and provincial medical research and health communities. Members of the AHFMR Scientific Advisory Council advise of major applications and policy decisions related to research. Other scientists and stakeholders in research, education and health serve on AHFMR committees or as consultants. The Foundation has nine standing review committees.

HOW ARE APPLICATIONS FOR FUNDING EVALUATED?

AHFMR follows the established procedure of evaluating applications by a peer review system. Applications are judged and rated by other researchers who have esteemed knowledge in the field of the applicant and related areas. Applications are assessed by external reviewers from throughout the world, and by internal AHFMR committees with representatives from Alberta and throughout North America. The committees then forward their recommendations to the Trustees.

SENIOR AWARD COMPETITION SUCCESS RATES

Personnel Awards	1992	1993	1994	1995
Clinical Investigator (New)	**7/4** (57%)	**9/5** (55%)	**5/4** (80%)	**5/3** (60%)
Clinical Investigator (Renew)	**6/5** (83%)	**4/3** (75%)	**3/3**(100%)	**2/2** (100%)
Population Health Investigator	-	-	-	**7/5** (71%)
Clinical Investigator to Scholar	**6/2** (33%)	**8/3** (37%)	**7/4** (57%)	**6/3** (50%)
Scholar (New)	**17/6** (35%)	**12/5** (42%)	**16/9** (56%)	**17/10** (59%)
Scholar to Senior Scholar	**14/6** (43%)	**11/6** (54%)	**8/6** (75%)	**14/10** (71%)
Senior Scholar (New)	-	-	**4/1** (25%)	**6/5** (83%)
Senior Scholar to Scientist	**10/2** (20%)	**8/3** (37%)	**11/3** (27%)	**7/2** (29%)
Scientist (Renew)	**9/5** (56%)	**4/3** (75%)	**6/4** (67%)	**5/5** (100%)
Independent Establishment	**5/2** (40%)	**10/5** (50%)	**3/1** (33%)	**4/2** (50%)
Totals	**74/32 (43%)**	**66/33 (50%)**	**3/1 (56%)**	**73/47 (64%)**

Results are expressed as number of applications received / number of applications approved. The percentages reflect success rate.

AHFMR received 1050 external reviews of applications which were considered by 277 members of nine review committees who advised the Foundation.

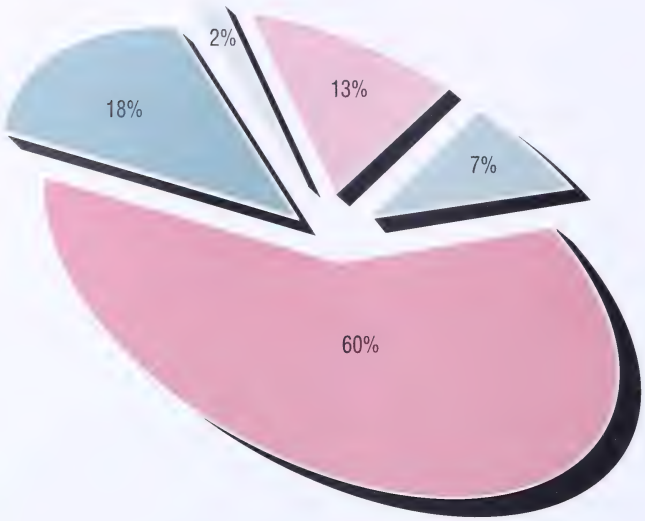
HOW DO SUCCESSFUL CANDIDATES RECEIVE FUNDING?

Initially, researchers funded by the AHFMR are recruited in cooperation with the university, hospital or other organizations where the researcher will conduct his or her research. Applications are submitted through the host organization and when the researcher is supported by AHFMR, he or she becomes an employee of the host organization, not AHFMR, although AHFMR pays salary and other support.

For information on the review system contact: Dr. Jacques Magnan, Director of Grants and Awards

AHFMR Expenditures from 1992/93 -1994/95

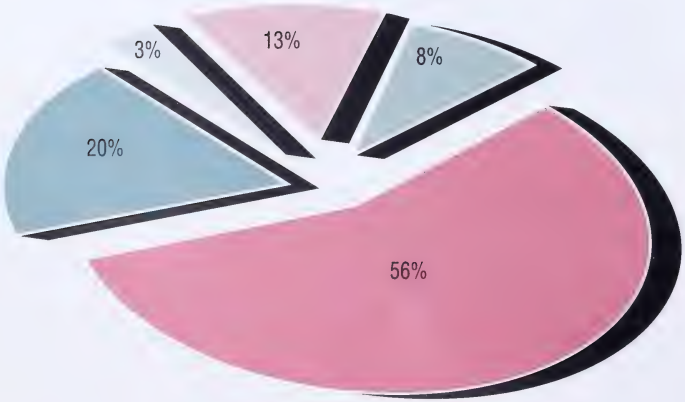
(TRIENNIAL REPORT PERIOD)



- Personnel – $47,227,000
- Training – $13,877,000
- Health Research – $1,292,000
- Other – $10,239,000
- Program Operation and Administration – $5,739,000

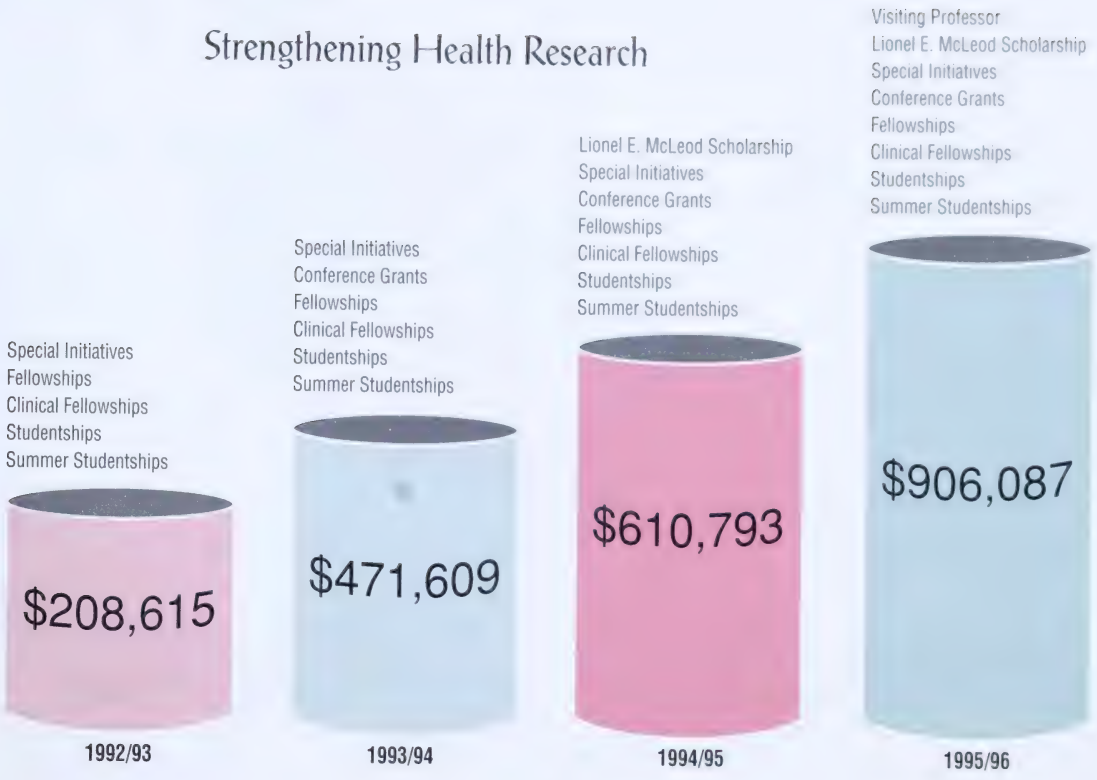
AHFMR Expenditures for 1995/96

(ANNUAL REPORT PERIOD)

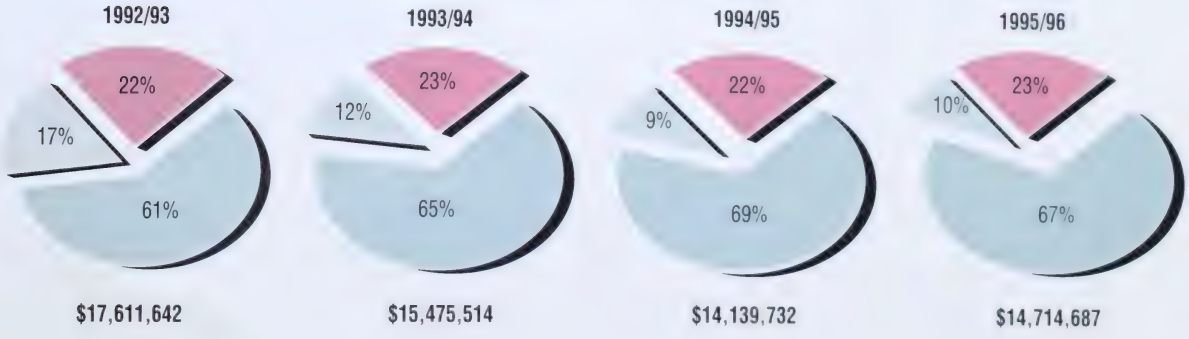


- Personnel – $14,715,000
- Training – $5,165,000
- Health Research – $906,000
- Other – $3,467,000
- Program Operation and Administration – $2,194,000

Strengthening Health Research



Support for Personnel in Basic Research

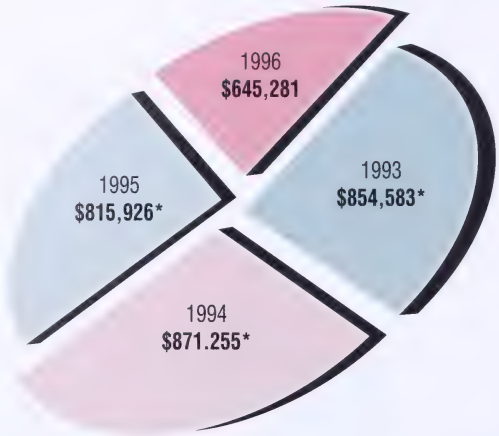


- Salary of Senior Investigators
- Direct Support – Establishment/Major Equipment Grants
- Indirect Costs – including Secretarial Support, Benefits, Clinical Income Assistance

NOTE: Support varies from year to year, based on number and quality of applications received.

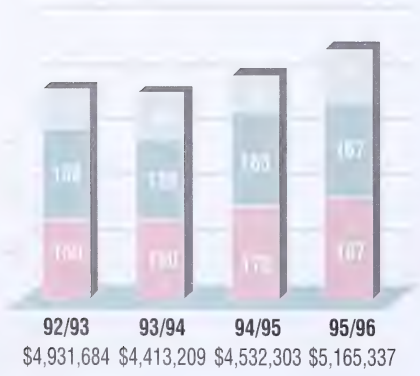
Supporting Community Initiatives and Fostering Collaboration

Special Initiatives
Health Knowledge Network
Visiting Scientists to/from Alberta
Visiting Professors
Conference/Workshop Grants
Visiting Lecturer and Travel Grants
Canadian Health Research Information Network
Centres of Excellence



**NOTE: 1993-1995 funding higher due to support for new Health Knowledge Network*

Funding for Implemented Students and Fellows Increased by 5%



Fellows
Students
Summer Students

Technology Commercialization Project Funding

NOTE: Support varies from year to year, based on number and quality of applications received.

Phase 3
Phase 2
Phase 1

MAJOR FUNDING PARTNERS

For every dollar invested by AHFMR, Heritage Researchers bring in two dollars to Alberta from other public and private funding sources.

MAJOR PARTNERS

University of Calgary and Affiliated Hospitals
University of Alberta and Affiliated Hospitals
University of Lethbridge
Government of Alberta
Medical Research Council of Canada
Alberta Cancer Board

OTHER PARTNERS

Abbott Laboratories
ACIC (Canada) Inc. and NRC Industrial Research Assistant Program
Action Research (U.K.)
Alberta Children's Hospital Foundation
Alberta Foundation for Diabetes Research
Alberta Heart and Stroke Foundation
Alberta Lottery Fund
Alberta Lung Association
Alberta Mental Health Research Unit
Alberta Paraplegic Foundation
Alberta Research Council
ALCAR
Alfred P. Sloan Foundation
Alzheimer Society of Canada
American Biosystems Inc.
American Heart Association
American Tinnitus Association
Amgen Canada
Andromaco Ltd.
ANR Trust Fund
Arthritis Society of Canada
Astra Pharmaceuticals Inc.
Atco Ltd. & Canadian Utilities Limited
Bayer/Canadian Red Cross Society Research & Development Fund
B.C. Cancer Agency
Berlex Canada Inc.
Blood Tribe
Boehringer Ingelheim (Canada) Ltd.
Bristol-Myers Squibb of Canada Inc.
British Biotechnology
British Columbia Health Care Research Foundation
Burroughs Wellcome (Canada)
Canadian Arthritis and Rheumatism Society
Canadian Bacterial Diseases Network (CBDN)
Canadian Breast Cancer Foundation
Canadian Diabetes Association
Canadian Foundation for AIDS Research
Canadian Foundation for Ileitis and Colitis
Canadian Genome Analysis & Technology Program
Canadian Heart Foundation
Canadian HIV Trials Network
Canadian Hypertension Society
Canadian Liver Foundation
Canadian Orthopaedic Foundation
Canadian Retinitis Pigmentosa Foundation
Canadian University Research Fund (CURF)
CANARIE
Cancer Research Society Inc.
Carol Yates Memorial Endowment Fund for Cancer Research
Centre for Advancement of Health, Foothills Hospital
Children's Health Centre Research (Alberta)
Children's Health Foundation
Ciba-Geigy Canada Ltd.
Clintec and Kabi Nutritional Companies
Connaught Laboratories Limited
Council for Tobacco Research
Crohn's and Colitis Foundation of Canada
Dai-ichi Co.
Deafness Research Foundation
Department of National Defense
Deutsche Forschungs Gemeinschaft (Germany)
Edmonton Civic Employees Charitable Assistance Fund
Edwin L. & John Custus Endowment
European Foundation for Gifted Disabled Persons
Fisher and Paykel (New Zealand)
Fisons Pharmaceuticals
Fraternal Order of Eagles (Alberta and Saskatchewan)
Galephar SA
Genderm Canada Inc.
Genetech, Inc.
Glaxo Wellcome Canada Inc.
Green Cross
Greg F. Rische Memorial Endowment Fund
Healthdyne Corporation
Heart and Stroke Foundation of Canada
Henri M. Toupin Medical Foundation
Hoffman Laroche Limited

Hospital for Sick Children Foundation
Howard Hughes Medical Institute
Hugo & Edith Weiss Memorial Fund
Human Frontier Science Program
Innogenics, Inc.
International Academy of Oral Medicine & Toxicology
International Association of Fire Fighters Burn Foundation
Izaak Walton Killam Trust
Janssen Pharmaceuticals Inc.
Jean Millar Barclay Endowment Fund
Johannsen Research Fund
Julia MacFarlane Diabetes Research Centre
Juvenile Diabetes Foundation International
Kidney Foundation of Canada
Leukemia Research Fund of Canada
Leukemia Society of America
Los Alamos
MacArthur Foundation Network on Developmental and Psychopathology
MacLachlan Fund
McDonald Scholarship Award
Max Bell Foundation
Medical Services Inc.
Medtronic, Inc.
Merck Frosst Canada Inc.
Merck Sharpe Dohme Research Labs
Miles Canada
Mitsubishi
MNI Fellowship
Molley Towell Perinatal Research Foundation
M.S.I. Foundation
Multiple Sclerosis Society of Canada
Muscular Dystrophy Association of Canada
Muttart Diabetes Research Training Centre
National Cancer Institute of Canada
National Collegiate Athletic Association
National Health Research and Development Program
National Institutes of Health (U.S.A.)
National Neurofibromatosis Foundation Inc.
National Research Centre
National Research Council of Canada
National Retinitis Pigmentosa Foundation of Canada
National SIDS Council of Australia
Natural Science Engineering Research Council
NCE NeuroScience Network
NCIC Terry Fox Project Grant
Netherlands Foundation for Biophysics
Networks of Centres of Excellence
Nordic Laboratories Inc.
North Atlantic Treaty Organization
Northern Alberta Children's Hospital Foundation
Oncology Endowment
Ontario Mental Health Foundation
Ortho Biotech
Ortho-McNeil Inc.
Pan-American Health Organization
Parker B. Francis Fellowship
Parke-Davis Pharmaceuticals Ltd.
Pasteur Merieux
PCRU Maxwell Foundation
Pharmaceutical Manufacturers Association of Canada
Procter and Gamble Inc.
Purdue Frederick Inc.
Rick Hansen Man in Motion Legacy Fund
Roussel Canada Inc.
Roy Allen Investigatorship
Ruth Rannie Memorial Endowment
Sandoz Canada Inc.
Sankyo Co. Ltd.
Savoy Foundation
Schering Co.
Schering Plough Research Institute
Schwarz-Pharma Inc.
Scleroderma Foundation
Searle Canada Inc.
Searle Inc., U.S.A.
Servier Laboratories
Shriners' Hospital for Crippled Children
Sigma Tau Industri Pharmaceutiche Riunite
S.J. Solberg Endowment for Cancer Research
Sleep Apnea Society of Alberta
Smith Kline Beecham
Special Services Research Committee (UAH)
Sport Canada Applied Sport Research Program
Sudden Infant Death Syndrome Foundation
Swiss National Foundation for Scientific Research
Syntex Incorporated
Thatcher Foundation
The Calgary Foundation Grant (David R. Ashford Fund)
TransCanada Pipeline Ltd.
Upjohn Company of Canada
Viridian
Wallace Genetic Foundation
Western Orthopedic Research Foundation
Whitaker Foundation
Workers' Compensation Board of Alberta
World Health Organization
Zymo-Genetics

"The McCaig Centre is an excellent example of private industry and AHFMR partnership. Working together we have created a world-class centre for research on joint injuries and arthritis."

Mr. Richard Melchin
Founding Director, Western Orthopedic Research Foundation, and President, Three Sisters Resort

* Note: As new funding from outside sources constantly comes into Alberta, some sources may have been inadvertently missed.

AWARD PROGRAMS OF THE FOUNDATION

Heritage Medical Scientists
Heritage Medical Scientists are internationally recognized for their contributions to science. This award encourages the recruitment and establishment of senior medical scientists who provide leadership in Alberta's scientific community. This award is for five years and renewable.

Heritage Senior Medical Scholars
This award assures the continued recruitment and establishment of exceptional investigators in areas relevant to medical and health research. Candidates must hold an M.D., D.D.S., D.V.M., Ph.D. or the equivalent and have an established record of excellence in independent research over several years as a faculty member. The candidate must also show an interest in training Alberta's future research scientists. This five-year award is nonrenewable.

Heritage Medical Scholars
Heritage Medical Scholars are investigators who have recently completed their postdoctoral research training and demonstrate the ability to initiate and conduct independent as well as collaborative research. Heritage Medical Scholars exhibit a desire and ability in training future research scientists. This nonrenewable five-year award ensures the continuing growth of Alberta's scientific community.

Heritage Clinical Investigators
Clinical Investigatorships allow clinically qualified investigators, holding an M.D. or D.D.S. and full-time academic appointments in a sponsoring institution, further research training and experience assisted by competitively funded basic or clinical researchers. Clinical investigators must have completed two to three years of supervised medical research training. This three-year award is renewable and may be extended for another three years. This award plays an important role in linking basic research to patient-based research and patient care.

Heritage Population Health Investigators
The Heritage Population Health Investigator encourages the recruitment and establishment of well-trained investigators in Alberta. The development of skilled investigators in the fields of population health research, quantitative and population sciences, health services research, social and behavioral sciences and the humanities will establish a centre of excellence for these fields in Alberta. Applicants who have recently completed post-M.D. or Ph.D. research training, but who have not yet established an independent research record are eligible for this three-year renewable award. This award provides investigators with the opportunity to further their research experience with the aid of a mentor.

Independent Establishment Grants for New Investigators
Independent Establishment Grants are awarded to new investigators who are not funded by the Foundation. The grant aids new investigators by providing equipment, material, and technical assistance that allows them to achieve their goals and increase their research productivity.

Fellowships
Heritage Medical Research Fellowships provide qualified candidates interested in pursuing a career in medical or health-related research, with full-time and part-time postdoctoral training in research in the area of medical science relevant to the aims of the Foundation. Candidates must be sponsored by a faculty supervisor and must demonstrate high academic standing and research ability.

Heritage Clinical Fellowships
The Heritage Clinical Fellowship Program provides individuals who hold an M.D. or D.D.S. degree and have completed or are near completion of subspecialty clinical training with the opportunity to pursue a career in health-related or clinical research in Alberta. Applicants must be sponsored by a faculty member who has a record of productive research and agrees to act as the Clinical Fellow's supervisor. Applicants are required to undertake two years of full-time research.

Heritage Clinical Traineeships
The Heritage Clinical Traineeship provides an opportunity for Alberta faculty members, demonstrating interest in clinical or health research, to acquire rigorous training in epidemiology, biostatistics, psychosocial sciences or clinical experimental methods and design. Upon entrance into the program, the investigators are part of a chain reaction that leads to the increased development of clinical and health research activities and the design of patient-based or population-oriented research in Alberta. This award is renewable.

Studentships
The Foundation provides full-time, part-time and summer Studentships in the area of medical and health research. Full-time and part-time Studentships are available for students who are either working towards professional health-related degrees or who are interested in pursuing a career in medical or health-related research. Summer Studentships provide the opportunity for students with exceptional academic records to participate directly in medical or health-related research in Alberta. This program encourages students to consider formal training and a career in health research.

Dr. Lionel E. McLeod Health Research Scholarship
The Scholarship was established in the memory of Dr. Lionel McLeod, who was head of Endocrinology at the University of Alberta, Dean of Medicine at the University of Alberta, and the founding President of the Alberta Heritage Foundation for Medical Research from 1981-1990. The award is given each year to an outstanding student at the Universities of Alberta, Calgary or British Columbia for full-time research that is relevant to human health.

Grants for Major Scientific Equipment
Major Scientific Equipment grants allow the university, on behalf of investigators, to purchase the necessary equipment that is essential to maintaining a high quality of research.

Institutional Support Programs
Institutional Support Programs aid Alberta's research community in accessing the most up-to-date information and technical developments in medical and health-related research. Programs such as the Visiting Lecturer and Travel Funds, Heritage Visiting Professorships, Heritage Visiting Scientists, Infrastructure Grants, Conferences and Workshops and Local Workshops, Retreats or Planning Sessions provide important information and resources necessary to the continuing development and conduct of modern health research in Alberta.

Technology Commercialization (TC) Program
The Technology Commercialization Program funds the commercialization of medically related innovations so that new technology can aid in improving health care. The program promotes research/industry collaboration. Technology Commercialization provides funding in three phases for commercially promising projects that do not fall under the mandate of traditional medical research funding agencies and are not developed adequately to attract outside investors.

Health Services Research and Innovation Fund (HSRIF)
The Health Services Research and Innovation Fund was established in 1991 by Alberta Health and, since November 1995, is administered by the Foundation. The HSRIF supports research designed to improve the organization, delivery, and quality of health services in Alberta.

Mental Health Research Fund
Alberta Mental Health Research Fund supports research that focuses on issues relevant to mental health. The Foundation began administering the Fund in November of 1995. The fund supports Alberta-based research and research training through the provision of annual grants for travel fellowships, visiting researchers, operating grants, and student scholarships.

AHFMR PERSONNEL

CURRENTLY IMPLEMENTED PERSONNEL AS OF MARCH 31, 1996

Heritage Medical Scientists

ANDREWS, Brian, Ph.D., Department of Biomedical Engineering, Faculty of Medicine, University of Alberta, "Applied neutral control"

BLEACKLEY, Robert, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "A molecular analysis of cell mediated cytotoxicity - bench to bedside"

BRINDLEY, David, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "Control of glycerolipid and lipoprotein metabolism"

BULLOCH, Andrew, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Modulation of neurite outgrowth by adult neurons"

DUFF, Henry, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Mechanistic approach to antiarrhythmic therapy"

EGGERMONT, Jos, Ph.D., Department of Psychology, Faculty of Social Sciences, University of Calgary, "Temporal coding in auditory cortex. Effects of maturation and induced plastic changes"

FIELD, Leigh, Ph.D., Department of Medical Genetics, Faculty of Medicine, University of Calgary, "Genetic analysis of several common complex disorders"

FRANK, Cyril, M.D., Department of Surgery, Faculty of Medicine, University of Calgary, "The mechanisms of scar remodeling"

GILES, Wayne, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Cardiac Electrophysiology: ionic currents, mathematical simulations and peptide inhibitors"

GORDON, Tessa, Ph.D., Department of Pharmacology, Faculty of Medicine, University of Alberta, "Neuromuscular plasticity and function after nerve injuries"

HULLIGER, Manuel, Ph.D., Department of Clinical Neurosciences, Faculty of Medicine, University of Calgary, "Basic and applied research in motor control"

IATROU, Kostas, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Chorion of bombyx mori as model system for study of organization, expression & evolution of eukaryotic multigene family"

JUGDUTT, Bodh, M.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Ventricular remodeling and healing after myocardial infarction: preservation of geometry and function"

MacVICAR, Brian, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Synaptic and non-synaptic mechanisms controlling neuronal excitability"

MARTIN, Renee, Ph.D., Department of Medical Genetics, Faculty of Medicine, University of Calgary, "Cytogenic and molecular analysis of human gametes"

McFADDEN, Grant, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Calgary, "Studies on the replication and biology of leporipoxviruses"

McGHEE, James, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "1. Molecular biology of early development 2. DNA-protein interactions 3. Genomic mapping"

PATERSON, Malcolm, Ph.D., Department of Molecular Oncology, Cross Cancer Institute, "Cancer predisposition, carcinogen hypersensitivity and faulty DNA metabolism"

PITTMAN, Quentin, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Physiological and pharmacological studies of peptides in brain"

PROCHAZKA, Arthur, Ph.D., Department of Physiology, Faculty of Medicine, University of Alberta, "Neural control of movement"

RABINOVITCH, Alexander, M.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Immunobiology of diabetes mellitus"

REHA-KRANTZ, Linda, Ph.D., Department of Biological Sciences, Faculty of Science, University of Alberta, "Mutational and biochemical studies of DNA polymerases"

REMMERS, John, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Neural control of breathing: fundamental and applied aspects"

REYNOLDS, John, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "The contribution of Peyer's patches to the immune system"

SCHURCH, Samuel, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Structure function relations of alveolar and airway surfactant"

TAYLOR, Diane, Ph.D., Department of Medical Microbiology and Infectious Diseases, Faculty of Medicine, University of Alberta, "Genetic studies of bacterial plasmids, campylobacter and helicobacter"

TYBERG, John, M.D., Ph.D., Department of Medicine, Faculty of Medicine, University of Calgary, "The hemodynamics of ventricular filling"

VANCE, Dennis, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "Phospholipid and lipoprotein metabolism"

WALLACE, John, Ph.D., Department of Pharmacology and Therapeutics, Faculty of Medicine, University of Calgary, "The pathogenesis of NSAID-induced gastric mucosal injury"

WALSH, Michael, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Mechanisms of regulation of smooth muscle contraction"

WITKOWSKI, Francis, M.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Mechanisms of cardiac defibrillation"

YOON, Ji-Won, Ph.D., Department of Microbiology and Infectious Diseases, Faculty of Medicine, University of Calgary, "Cellular and molecular pathogenic mechanisms for the induction of insulin-dependent diabetes mellitus and its possible prevention"

YOUNG, James, Ph.D., Department of Physiology, Faculty of Medicine, University of Alberta, "Molecular physiology of nucleoside and amino acid transporter proteins"

Heritage Senior Medical Scholars

AUER, Roland, M.D., Ph.D., Department of Pathology, Faculty of Medicine, University of Calgary, "Brain necrosis in ischemia and drug treatment"

ANDERSON, Maurice, Ph.D., Department of Anatomy, Faculty of Medicine, University of Calgary, "Transduction of inductive signals during synaptogenesis"

BARNES, Steven, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Synaptic plasticity in the retina: presynaptic ion channels at the photoreceptor synapse"

BAZETT-JONES, David, Ph.D., Department of Anatomy, Faculty of Medicine, University of Calgary, "Structure and function of transcription complexes"

BEFUS, Dean, Ph.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Microenvironmental and neuroendocrine regulation of mast cell function and inflammation"

BENISHIN, Christina, Ph.D., Department of Physiology, Faculty of Medicine, University of Alberta, "Endogenous and exogenous regulators of ion channels"

CAMPENOT, Robert, Ph.D., Department of Anatomy and Cell Biology, Faculty of Medicine, University of Alberta, "Control of nerve growth and growth-related gene expression in rat peripheral neurons in compartmented cultures"

COLMERS, William, Ph.D., Department of Pharmacology, Faculty of Medicine, University of Alberta, "NPY neuromodulation in CNS"

EASTON, Paul, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Respiratory muscle compensation, during REM sleep and wakefulness, with diaphragm paralysis or spinal cord injury"

EDWARDS, Dylan, Ph.D., Department of Pharmacology and Therapeutic Medicine, Faculty of Medicine, University of Calgary, "Matrix metalloproteinases and tissue inhibitors of metalloproteinases in development and cancer"

ELLIOTT, John, M.D., Ph.D., Department of Medical Microbiology and Immunology, Faculty of Medicine, University of Alberta, "Improving pancreatic islet graft survival by transfer of genes encoding immunomodulatory proteins into donor islets"

ELLISON, Michael, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "The role of ubiquitin dependent proteolysis in cell proliferation"

FEWELL, James, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Arousal response to cardiorespiratory stimuli"

FINEGOOD, Diane, Ph.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Regulation and interactions of the factors determining metabolic control"

FLIEGEL, Larry, Ph.D., Department of Paediatrics, Faculty of Medicine, University of Alberta, "Ion exchangers of heart sarcolemma"

FRENCH, Robert, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Ion channels of excitable membranes"

FUJITA, Donald, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Structure, regulation and function of the human c-src gene, its product pp60c-src and other tyrosine kinases"

KARGACIN, Gary, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Structure and regulation of smooth muscle"

KING, Malcolm, Ph.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Regulation of airway surface liquid secretion and clearance"

LOPASCHUK, Gary, Ph.D., Department of Paediatrics, Faculty of Medicine, University of Alberta, "Regulation of fatty acid oxidation in the heart by acetyl CoA carboxylase"

MAINS, Paul, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Molecular and genetic analysis of c. elegans development"

MICHALAK, Marek, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "Structure and function of membrane proteins"

MOORE, Graham, Ph.D., Department of Pharmacology and Therapeutic Medicine, Faculty of Medicine, University of Calgary, "Peptide hormones: bioactive conformation, receptor recognition, and design of mimetics"

READ, Randy, Ph.D., Department of Medical Microbiology Immunology, Faculty of Medicine, University of Alberta, "Protein crystallography and rational drug design"

RICE, Stephen, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "Regulation of gene expression by herpes simplex virus immediate-early proteins ICP27 and ICP22"

RYAN, Robert, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "Modulation of lipoprotein structure and metabolism by facilitated lipid transfer"

SCHNETKAMP, Paul, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Calgary, "Molecular components of signal transduction in retinal rods"

SCHRYVERS, Anthony, M.D., Ph.D., Department of Microbiology and Infectious Diseases, Faculty of Medicine, University of Calgary, "Molecular characterization of the structure and function of bacterial receptors for transferrin and lactoferrin"

SNYDER, Floyd, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Genotype-phenotype and structure-function studies in nucleotide metabolism"

SOKOL, Pamela, Ph.D., Department of Microbiology and Infectious Diseases, Faculty of Medicine, University of Calgary, "Pathogenesis of pseudomonas aeruginosa and p. cepacia infections"

SPENCER, Charlotte, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "RNA polymerase II modifications and transcription regulation during virus infection"

STEVENSON, Bruce, Ph.D., Department of Anatomy and Cell Biology, Faculty of Medicine, University of Alberta, "Molecular analysis of ZO-1 and the tight junction"

VOGEL, Hans, Ph.D., Department of Biological Sciences, Faculty of Sciences, University of Calgary, "Multinuclear NMR Studies of regulatory proteins and metabolism"

WAISMAN, David, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Covalent regulations of Ca2+-binding proteins"

WONG, Norman, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Nuclear mechanisms of thyroid hormone action"

WONG, Sui-Lam, Ph.D., Department of Biological Sciences, Faculty of Science, University of Calgary, "Engineering of a bacterial expression and secretion system and its application for the production of authentic and engineered proteins"

YOKOYAMA, Shinji, M.D., Ph.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Mechanism and regulation of cholesterol reverse transport by plasma lipoproteins"

ZWEIRS, Hindrick, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Neutropeptides, phosphoproteins and neural plasticity"

Heritage Medical Scholars

AGELLON, Luis, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "Cholesterol 7a-hydroxylase function and gene expression"

BATESON, Alan, Ph.D., Department of Pharmacology, Faculty of Medicine, University of Alberta, "Regulation and modulation of GABA A receptor expression"

BURKE, Brian, Ph.D., Department of Anatomy, Faculty of Medicine, University of Calgary, "The nuclear pore complex and nucleocytoplasmic transport"

CHANG, Lung-Ji, Ph.D., Department of Microbiology and Immunology, Faculty of Medicine, University of Alberta, "Isolation of human cDNA encoding for the HIV attachment and penetration factors"

CHEN, Sui, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Structure, function and regulation of ryanodine receptors in smooth muscle"

DEANS, Julie, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Molecular analysis of the multimeric CD20 complex on B lymphocytes"

DEREWENDA, Zygmunt, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "Structure-function relationships in lipolytic enzymes"

GILLIS, Anne, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Ventricular dysfunction and antiarrhythmic drug pharmacodynamics"

GREER, John, Ph.D., Department of Physiology, Faculty of Medicine, University of Alberta, "Development of neuronal mechanisms controlling breathing"

GRUNDY, Paul, M.D., Department of Molecular Oncology, Cross Cancer Institute, "Identification and assessment of pathological significance of additional Wilms tumor loci"

HO, Anthony, Ph.D., Department of Physiology, Faculty of Medicine, University of Alberta, "Multiple receptor regulated cyclic nucleotides: post-receptor mechanisms"

HO, May, M.D., Department of Microbiology and Infectious Disease, Faculty of Medicine, University of Calgary, "Cellular immune responses in P. falciparum malaria"

HOBMAN, Tom, Ph.D., Department of Anatomy and Cell Biology, Faculty of Medicine, University of Alberta, "Protein trafficking between the endoplasmic reticulum and golgi"

KANE, Kevin, Ph.D., Department of Medical Microbiology and Immunology, Faculty of Medicine, University of Alberta, "Molecular interactions governing cytotoxic T cell recognition and transmembrane signaling"

KNETEMAN, Norman, M.D., Department of Surgery, Faculty of Medicine, University of Alberta, "Rejection of allotransplanted pancreatic islets: prevention, early diagnosis, and treatment"

KUBES, Paul, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "Polymorphonuclear leukocyte-endothelial cell interactions: the role of nitric oxide"

KUNIMOTO, Dennis, M.D., Department of Medical Microbiology and Immunology, Faculty of Medicine, University of Alberta, "Prevention of myocobacterial infections"

LEE, Samuel, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Membrane studies in experimental cirrhotic cardiomyopathy"

LESKIW, Brenda, Ph.D., Department of Microbiology, Faculty of Science, University of Alberta, "The BldA gene and its role in antibiotic production and morphological differentiation"

LOUTZENHISER, Rodger, Ph.D., Department of Pharmacology and Therapeutic Medicine, Faculty of Medicine, University of Calgary, "Modulation of myogenic reactivity of renal afferent arterioles"

LYTTON, Johnathan, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Molecular regulation of Na/Ca exchanger function"

MEDDINGS, Jonathan, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Physiology of intestinal inflammation

OLSON, David, Ph.D., Department of Obstetrics and Gynecology, Faculty of Medicine, University of Alberta, "Eicosanoid synthesis and function in perinatal physiology"

OSTERGAARD, Hanne, Ph.D., Department of Medical Microbiology and Immunology, Faculty of Medicine, University of Alberta, "CD45 protein tyrosine phosphatase: role in T cell activation"

PASDAR, Manijeh, Ph.D., Department of Anatomy and Cell Biology, Faculty of Medicine, University of Alberta, "Regulation of desmosome assembly in MDCK epithelial cells"

RADOMSKI, Marek, M.D., Ph.D., Department of Obstetrics and Gynecology, Faculty of Medicine, University of Alberta, "Role of nitric oxide in platelet function in normal and pathological pregnancies"

RASMUSSEN, Colin, Ph.D., Department of Anatomy and Cell Biology, Faculty of Medicine, University of Alberta, "Molecular genetic analysis of calmodulin-dependent cell cycle control"

RIABOWOL, Karl, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "The POS protein complex in transcription and transformation"

ROSENBERG, Susan, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "Homologous recombination and mutation in human cells and in escherichia coli"

SCHULZ, Richard, PH.D., Department of Paediatrics, Faculty of Medicine, University of Alberta, "Nitric oxide and myocardial dysfunction"

SCOTT, Brent, M.D., Department of Pediatrics, Faculty of Medicine, University of Calgary, "Intestinal motility"

SHARKEY, Keith, Ph.D., Department of Medical Physiology, Faculty of Medicine, University of Calgary, "GI afferent nerves and inflammation"

SHIBUYA, Ellen, Ph.D., Department of Anatomy and Cell Biology, Faculty of Medicine, University of Alberta, "Signal transduction and cell cycle reentry in oocytes"

STONE, James, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Alberta, "Genetics of ras"

SYED, Naweed, Ph.D., Department of Anatomy, Faculty of Medicine, University of Calgary, "Mechanisms underlying synaptogenesis"

TREDGET, Edward, M.D., Department of Surgery, Faculty of Medicine, University of Alberta, "The effect of interferon alpha 2B on the biology of human hypertrophic scars"

TSE, Amy, Ph.D., Department of Pharmacology, Faculty of Medicine, University of Alberta, "Neuroendocrine control of adrenocorticotropic hormone (ACTH) secretion"

TSE, Frederick, Ph.D., Department of Pharmacology, Faculty of Medicine, University of Alberta, "Control of exocytosis by intracellular messengers"

TURNER, Raymond, Ph.D., Department of Anatomy, Faculty of Medicine, University of Calgary, "Conditional bursting circuit in a vertebrate sensory system"

WALTER, Michael, Ph.D., Department of Ophthalmology, Faculty of Medicine, University of Alberta, "Identification of the molecular basis of iridogoniodysgenesis"

WARNOCK, Garth, M.D., Department of Surgery, Faculty of Medicine, University of Alberta, "Studies of the isolation and transplantation of islets for type 1 diabetes"

WEISS, Samuel, Ph.D., Department of Anatomy, Faculty of Medicine, University of Calgary, "A mammalian central nervous system stem cell"

WINDHORST, Uwe, M.D., Department of Clinical Neurosciences, Faculty of Medicine, University of Calgary, "Integration of recurrent inhibition and propriospinal feedback"

WOZNIAK, Richard, Ph.D., Department of Anatomy and Cell Biology, Faculty of Medicine, "The role of integral membrane proteins in the organization of the nuclear pore"

YOUNG, Dallan, Ph.D., Department of Medical Biochemistry, Faculty of Medicine, University of Calgary, "Investigation of signal transduction pathways in the fission yeast schizosaccharomyces pombe and mammals"

ZACKSON, Saul, Ph.D., Department of Biochemistry, Faculty of Medicine, University of Calgary, "Formation of cell contracts: induction and assembly of the focal adhesion"

ZERNICKE, Ronald, Ph.D., Department of Surgery, Faculty of Medicine, University of Calgary, "Functional adaptation of bone"

ZOCHODNE, Douglas, M.D., Department of Clinical Neurosciences, Faculty of Medicine, University of Calgary, "Peptides and opioids in peripheral nerve injury"

Heritage Clinical Investigators

ANDERSON, Todd, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Endothelial control of coronary vasomotion and blood flow"

BELL, Robert, M.D., Department of Clinical Neurosciences, Faculty of Medicine, University of Calgary, "Immunoglobulin heavy chain variable region polymorphisms and MS susceptibilty"

BRAY, Robert, M.D., Department of Surgery, Faculty of Medicine, University of Calgary, "Ligament blood supply"

BROWN, Christopher, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Structure-function relationships of GM-CSF and its receptor"

BUTZNER, Decker, M.D., Department of Paediatrics, Faculty of Medicine, University of Calgary, "Intestinal injury and repair in well-nourished and malnourished infants"

CHIK, Constance, M.D., Ph.D., Department of Medicine, Faculty of Medicine, University of Alberta, "The effects of PACAP on intracellular mechanisms and ion channels"

COCKFIELD, Sandra, M.D., Department of Medicine, Faculty of Medicine, University of Alberta, "The regulation of interferon-γ expression in vivo by bacterial lipopolysaccharide"

DAVIES, Herbert, M.D., Department of Paediatrics, Faculty of Medicine, University of Calgary, "Impact of expert guidelines on incidence of neonatal group B strep in Alberta"

FRANCIS, Gordon, M.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Tyrosyl radical-mediated oxidation of high density lipoprotein"

HASAN, Shabih, M.D., Department of Paediatrics, Faculty of Medicine, University of Calgary, "Role of vagal afferents in the control of breathing during perinatal life"

KAVANAGH, Katherine, M.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Mechanisms of ventricular tachyarrhythmias and their electrical termination"

LUCAS, Alexandra, M.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Molecular and spectroscopic investigation into atherosclerotic plaque growth"

MAKSYMOWYCH, Wolodymyr, M.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Antigen processing genes in ankylosing spondylitis"

MODY, Christopher, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Anti-microbial defense mechanisms of the lung in T-helper cell deficiency"

MOORE, Ronald, M.D., Ph.D., Department of Surgery, Faculty of Medicine, University of Alberta, "Preclinical PDT studies with second generation photosensitizers"

PENN, Andrew, M.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Strategies for an effective clinical trial program for stroke"

READ, Ronald, M.D., Ph.D., Department of Microbiology and Infectious Disease, Faculty of Medicine, University of Calgary, "Iron transport and antibiotic delivery in xanthomonas maltophilia"

SILVERSTONE, Peter, M.D., Department of Psychiatry, Faculty of Medicine, University of Alberta, "Effects of lithium on brain inositol concentrations: an MRS study"

SWAIN, Mark, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Role of endogenous opioids in hepatic inflammation"

TEO, Koon, Ph.D., Department of Medicine, Faculty of Medicine, University of Alberta, "Clinical trials in cardiovascular disease"

WANKE, Irene, M.D., Ph.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Regulation of hepatic gene expression in diabetes mellitus"

WOODMAN, Richard, M.D., Department of Medicine, Faculty of Medicine, University of Calgary, "Characterization of antineutrophil cytoplasmic antibodies (ANCA)-induced Glomerular injury"

ALBERTA HERITAGE FOUNDATION FOR MEDICAL RESEARCH

FINANCIAL STATEMENTS

MARCH 31, 1996

Auditor's Report	70
Balance Sheet	71
Statement of Revenue, Expense and Unexpended Funds	72
Statement of Changes in Financial Position	73
Notes to the Financial Statements	74
Schedule of Operations Revenue, Expense and Unexpended Funds	78
Schedule of Medical Innovation Program Revenue, Expense and Unexpended Funds	79
Schedule of Health Research Collaboration Revenue, Expense and Unexpended Funds	80

ALBERTA LEGISLATURE

OFFICE OF THE AUDITOR GENERAL

AUDITOR'S REPORT

To the Trustees of the Alberta Heritage Foundation
for Medical Research

I have audited the balance sheet of the Alberta Heritage Foundation for Medical Research as at March 31, 1996 and the statements of revenue, expense and unexpended funds, and changes in financial position for the year then ended. These financial statements are the responsibility of the Foundation's management. My responsibility is to express an opinion on these financial statements based on my audit.

I conducted my audit in accordance with generally accepted auditing standards. Those standards require that I plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In my opinion, these financial statements present fairly, in all material respects, the financial position of the Foundation as at March 31, 1996 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles.

Peter Valentine

FCA
Auditor General

Edmonton, Alberta
June 21, 1996

BALANCE SHEET

MARCH 31, 1996
(thousands of dollars)

	1996	1995
ASSETS		
Cash	$9,132	$7,491
Accounts receivable	50	102
Advances and prepaid expenses	205	87
Mortgages receivable	-	25
Capital assets (Note 4)	463	299
Deferred pension costs (Note 5)	17	18
	$9,867	$8,022
LIABILITIES AND UNEXPENDED FUNDS		
Accounts payable and accrued liabilities	$827	$ 369
Accrued retirement allowance (Note 5)	99	86
Deferred lease inducement	95	-
	1,021	455
Unexpended funds:		
Operations (Schedule 1)	(272)	575
Medical Innovation Program (Schedule 2 and Note 6)	7,133	6,992
Health Research Collaboration (Schedule 3 and Note 7)	1,985	-
	8,846	7,567
	$9,867	$8,022

The accompanying notes and schedules are part of these financial statements.

STATEMENT OF REVENUE, EXPENSE AND UNEXPENDED FUNDS

FOR THE YEAR ENDED MARCH 31, 1996
(thousands of dollars)

	1996	1995
Revenue:		
Operations (Schedule 1)	$26,237	$23,221
Medical Innovation Program (Schedule 2)	518	453
Health Research Collaboration (Schedule 3 and Note 7)	2,257	-
Total revenue	29,012	23,674
Expense:		
Grants and awards		
Operations (Schedule 1)	24,253	23,220
Medical Innovation Program (Schedule 2)	766	881
Health Research Collaboration (Schedule 3)	99	-
	25,118	24,101
Program operation		
Operations (Schedule 1)	655	380
Medical Innovation Program (Schedule 2)	185	89
Health Research Collaboration (Schedule 3)	35	-
	875	469
Administration		
Operations (Schedule 1)	1,539	1,599
Medical Innovation Program (Schedule 2)	63	50
Health Research Collaboration (Schedule 3)	138	-
	1,740	1,649
Total expense	27,733	26,219
Excess (deficiency) of revenue over expense for the year	1,279	(2,545)
Unexpended funds at beginning of year	7,567	10,112
Unexpended funds at end of year	$8,846	$7,567

STATEMENT OF CHANGES IN FINANCIAL POSITION

FOR THE YEAR ENDED MARCH 31, 1996
(thousands of dollars)

	1996	1995
Operating activities:		
Excess (deficiency) of revenue over expense for the year	$1,279	$(2,545)
Add charges not affecting cash:		
Amortization of capital assets	73	71
Loss on disposal of capital assets	5	6
Amortization of lease inducement	(5)	-
	1,352	(2,468)
Net change in non-cash working capital items:		
Accounts receivable	52	80
Advances and prepaid expenses	(118)	100
Mortgages receivable	25	108
Deferred pension costs	1	(16)
Accounts payable and accrued liabilities	458	33
Accrued retirement allowance	13	18
Deferred lease inducement	100	-
Net cash provided by (applied to) operating activities	1,883	(2,145)
Investing activities:		
Purchase of capital assets	(242)	(39)
Net cash applied to investing activities	(242)	(39)
Net increase (decrease) in cash for the year	1,641	(2,184)
Cash at beginning of year	7,491	9,675
Cash at end of year	$9,132	$7,491

NOTES TO THE FINANCIAL STATEMENTS

MARCH 31, 1996

Note 1: Authority and Purpose

The Alberta Heritage Foundation for Medical Research (the "Foundation") operates under the authority of the Alberta Heritage Foundation for Medical Research Act, Chapter A-26, Revised Statutes of Alberta 1980, as amended.

The Foundation supports and promotes research in Alberta to improve health and thereby the quality of life of Albertans and people throughout the world.

Note 2: Significant Accounting Policies and Reporting Practices

(a) Capital Assets and Amortization

Capital assets are recorded at cost less accumulated amortization. Capital assets, except for leasehold improvements, are amortized on a straight-line basis over their estimated useful lives at the following annual rates:

Furniture and office equipment	10%
Computer equipment	20%

Leasehold improvements are amortized on a straight-line basis over the term of the lease.

(b) Revenue Recognition

The transfers from the Province of Alberta, Department of Health and the Alberta Heritage Foundation for Medical Research Endowment Fund are recorded as revenue in the year for which they are approved.

(c) Grants and Awards Expense

Grants and awards approved by the Trustees of the Foundation are recorded as expense when the awardee has been notified of the amount of the award and all terms and conditions of eligibility for payment of the award have been met.

(d) Pension

Pension Expense

Salaries and benefits include employer pension plan contributions made during the year, the amortization of experience gains and losses, and the increase in accrued retirement allowance.

Deferred Pension Costs

Deferred pension costs represent the cumulative difference between the amounts expensed and the funding contributions required under the Foundation's pension plan.

Accrued Retirement Allowance

Accrued retirement allowance consists of the unfunded liability for a retirement allowance for the Foundation's President.

(e) Lease Inducement

The lease inducement, a cash payment received by the Foundation on the lease for office premises, has been deferred and is accounted for as a reduction of office rental expense on a straight-line basis over the term of the lease.

Note 3: Alberta Heritage Foundation for Medical Research Endowment Fund

The Endowment Fund operates pursuant to the Alberta Heritage Foundation for Medical Research Act and consists of an initial endowment of $300,000,000 from the Alberta Heritage Savings Trust Fund together with cumulative earnings thereon, less cumulative transfers to the Foundation.

Transfers to the Foundation are available at the request of the Trustees of the Foundation provided that such transfers do not result in the net assets of the Endowment Fund, valued at cost, being less than the initial endowment.

At March 31, 1996 the net assets of the Endowment Fund valued at cost were approximately $674,729,000 (1995 $635,355,000) and valued at market were approximately $765,672,000 (1995 $686,843,000).

Note 4: Capital Assets

	1996			1995
	Cost	Accumulated Amortization	Net Book Value	Net Book Value
	(thousands of dollars)			
Furniture and office equipment	$328	$152	$176	$110
Computer equipment	363	166	197	189
Leasehold improvements	94	4	90	-
	$785	$322	$463	$299

Note 5: Pension Plan

The Foundation's pension plan is a defined benefit plan. Benefits are based on years of service and average salary in the final years of employment.

Pension expense includes the amortization of experience gains and losses. These amounts are being amortized on a straight-line basis over periods from 14 to 21 years. The cumulative difference between the amounts expensed and the funding contributions required is shown on the balance sheet as deferred pension costs of $17,200 (1995 $17,700).

The Plan's status as at March 31, 1996 is as follows:

	1996	1995
Assets	$846,200	$645,800
Less actuarial value of accrued pension benefits	757,200	619,200
Excess balance	$ 89,000	$ 26,600

The value of accrued pension benefits was determined by an actuarial valuation as at March 31, 1995 extrapolated to March 31, 1996. The actuarial valuation was determined using the projected benefit method prorated on service. Assumptions used in the valuations are based on the Foundation's best estimate of future events. The Plan's future experience will inevitably vary, perhaps significantly, from the assumptions. Any differences between the actuarial assumptions and future experience will emerge as gains or losses in future valuations and will be amortized over the expected average remaining service life of the employee group.

Retirement Allowance

In December 1993, the Board of Trustees approved a retirement allowance package for the President. The unfunded liability at March 31, 1996 of $99,200 (1995 $86,600) has been accrued and expensed. This liability was determined by an actuary using the same assumptions that were used to value the pension plan.

Note 6: Medical Innovation Program

The Foundation administers funds for the Medical Innovation Program on behalf of the Minister of Economic Development and Tourism. The Program is scheduled to end March 31, 1997 at which time all unallocated and undisbursed funds are to be returned to the Province of Alberta. An extension of this Program is currently under negotiation.

Note 7: Health Research Collaboration

During 1996, the Foundation entered into an agreement (the "Agreement") with Alberta Health to facilitate and enhance health research and health technology assessment and their dissemination in the Province of Alberta. As part of the Agreement, the Foundation assumed overall responsibility for:

(a) planning, development and coordination of a health research agenda for the Province;

(b) the administration of two health research funds (Health Services Research and Innovation Fund and the Mental Health Research Fund);

(c) a health technology assessment function; and

(d) communication and dissemination of health research information.

Under the terms of the Agreement, the Foundation received $2,256,956 for the period September 1, 1995 to March 31, 1996.

Note 8: Recoveries on Technology Commercialization Projects

The Foundation has entered into various agreements to fund technology commercialization projects. The projects involved have high scientific merit, but are speculative with both technical and commercial risk. Any recoveries by the Foundation under these agreements will be long-term, in some cases at least ten years. In addition to recoveries, some agreements contain a provision for future royalty payments. Amounts ultimately receivable by the Foundation are not determinable at this time and will be recognized as revenue when they are due and collection is reasonably assured.

Note 9: Commitments

(a) Grants and Awards

As at March 31, 1996 the Foundation had committed the following for grants and awards programs:

	Operations	Health Research Collaboration	Total
	(thousands of dollars)		
Personnel programs	$35,710	$ -	$35,710
Training programs	3,163	-	3,163
Health programs	629	-	629
Other programs	1,735	1,302	3,037
	$41,237	$1,302	$42,539

(b) Office Premises

The Foundation has entered into a 65 month lease for office premises. This lease expires on May 31, 2001.

(c) Total Commitments

Total commitments pertain to the following fiscal years:

	Grants and Awards	Office Premises	Total
	(thousands of dollars)		
1996-97	$19,362	$39	$19,401
1997-98	9,373	41	9,414
1998-99	6,550	48	6,598
1999-2000	4,411	48	4,459
2000-01	2,377	57	2,434
2001-02	466	10	476
	$42,539	$243	$42,782

Note 10: Salaries and Benefits

	1996				1995	
	Number of Individuals	Salaries[1]	Benefits[2]	Total[3]	Number of Individuals	Total
Chairman	1	$10,600	$261	$10,861	1	$13,075
Board of Trustees	8	75,873	1,199	77,072	8	69,635
		86,473	1,460	87,933		82,710
President and Chief Executive Officer	1	160,000	38,421	198,421	1	203,958
Director, Grants and Awards	1	87,000	15,334	102,334	1	121,864
Financial Officer	1	70,000	15,642	85,642	1	78,287
Other salaried staff (average 1996 $40,547, 1995 $36,817)	14 [4]	473,105	94,937	568,042	12 [4]	441,808
Non-salaried staff	2	44,043	4,841	48,884	5	85,458
		834,148	169,175	1,003,323		931,375
		$920,621	$170,635	$1,091,256		$1,014,085

(1) Salaries include regular base pay, overtime, retainers, honoraria, and any other direct cash remuneration.

(2) Benefits include the Foundation's share of all employee benefits and contributions or payments made on behalf of employees including pension, no-interest mortgage, health care, dental coverage, out-of-country medical benefits, group life insurance, accidental disability and dismemberment insurance, long- and short-term disability plans and professional memberships.

(3) Salaries and benefits are distributed to various expense categories including committee meetings and fees, Trustee meetings and fees, salaries and benefits and office administration (see Schedules 1, 2 and 3).

(4) Number of individuals is stated in terms of full-time equivalents.

Note 11: Budget

Budget information is disclosed, by activity centre, in Schedules 1 and 2. The 1995-96 budget was approved by the Trustees in March 1995. Supplemental budgets were approved in September 1995 and December 1995.

Funds are transferred from the Endowment Fund on an as needed basis.

Note 12: Comparative Figures

Certain 1995 figures have been reclassified to conform to 1996 presentation.

Note 13: Approval of Financial Statements

These financial statements were reviewed by the Audit Committee and recommended to the Trustees for approval.

SCHEDULE 1

SCHEDULE OF OPERATIONS REVENUE, EXPENSE AND UNEXPENDED FUNDS

FOR THE YEAR ENDED MARCH 31, 1996

(thousands of dollars)

	1996		1995
	Actual	Budget	Actual
Revenue:			
Transfers from the Alberta Heritage Foundation for Medical Research Endowment Fund	$ 26,000	$ 26,000	$ 23,000
Interest	237	237	221
	26,237	26,237	23,221
Expense:			
Grants and awards			
Personnel	14,715	14,511	14,140
Training	5,165	5,094	4,532
Health research	906	1,013	611
Other	3,467	4,753	3,937
	24,253	25,371	23,220
Program operation			
S.E.A.R.C.H. training program	297	18	-
Committee meetings and fees	219	294	237
Scientific Advisory Council	109	118	107
Postage and courier	30	41	36
	655	471	380
Administration			
Salaries and benefits	890	842	913
Office administration	318	354	362
Communication and education	107	137	103
Trustee meetings and fees	104	116	94
Amortization of capital assets	73	75	71
Planning and program development	47	61	56
	1,539	1,585	1,599
Total expense	26,447	27,427	25,199
Deficiency of revenue over expense before transfer	(210)	(1,190)	(1,978)
Transfer to Medical Innovation Program	(637)	-	-
Deficiency of revenue over expense	(847)	(1,190)	(1,978)
Unexpended funds at beginning of year	575	575	2,553
Unexpended funds (deficiency) at end of year	$ (272)	$ (615)	$ 575

SCHEDULE 2

ALBERTA HERITAGE FOUNDATION FOR MEDICAL RESEARCH

SCHEDULE OF MEDICAL INNOVATION PROGRAM REVENUE, EXPENSE AND UNEXPENDED FUNDS

FOR THE YEAR ENDED MARCH 31, 1996
(thousands of dollars)

	1996		1995
	Actual	Budget	Actual
Revenue:			
Interest	510	510	445
Recoveries on technology commercialization projects	8	-	8
	518	510	453
Expense:			
Grants and awards			
Projects	744	950	860
Industry support	22	50	21
	766	1,000	881
Program operation			
Consulting and legal	114	35	49
External review and project monitoring	37	35	18
Committee meetings and fees	34	28	22
	185	98	89
Administration			
Salaries and benefits	55	52	44
Publications and office	8	4	6
	63	56	50
Total expense	1,014	1,154	1,020
Deficiency of revenue over expense before transfer	(496)	(644)	(567)
Transfer from Operations	637	-	-
Excess (deficiency) of revenue over expense	141	(644)	(567)
Unexpended funds at beginning of year	6,992	6,992	7,559
Unexpended funds at end of year	$7,133	$6,348	$6,992

SCHEDULE 3

ALBERTA HERITAGE FOUNDATION FOR MEDICAL RESEARCH

SCHEDULE OF HEALTH RESEARCH COLLABORATION REVENUE, EXPENSE AND UNEXPENDED FUNDS

FOR THE YEAR ENDED MARCH 31, 1996
(thousands of dollars)

	1996 Actual [1]
Revenue:	
Transfers from Alberta Health under the Health Research Collaboration Agreement	$2,257
Expense:	
Grants and awards	99
Program operation	
External review/site visit	18
Committee meetings and fees	17
	35
Administration	
Salaries and benefits	78
Recruitment	40
Office administration	20
	138
Total expense	272
Excess of revenue over expense being unexpended funds at end of year	$1,985

(1) There are no current year budget or comparative actual figures as the Foundation assumed responsibility for health research collaboration effective September 1, 1995 (See Note 7).

Editor: Lois Hammond

Writers: Lois Hammond, Nancy Whelan, Kathleen Thurber

Designer: Roberge Hoffman Young Graphic Design Inc.

Illustrator: Artsmith Communications

Photographers: Ted Grant, Kim Griffiths, Don Hammond, Sima Khorrami, Trudy Lee, Jim Peacock, Ted Shehinski, Brian Urlacher, Rudy Zwamborn

Printer: Capital Colour Press Ltd.
Paper stock: 80 lb. Bravo Dull cover and 80 lb. Bravo Dull text
Photos are printed as 2-black duotones

National Library of Canada
Bibliothèque nationale du Canada
3 3286 51204 9467

Alberta Heritage
Foundation for
Medical Research

October, 1996
ISBN 0-9697154-1-2
Printed on recyclable paper